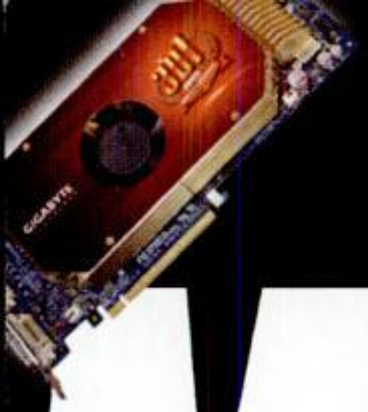

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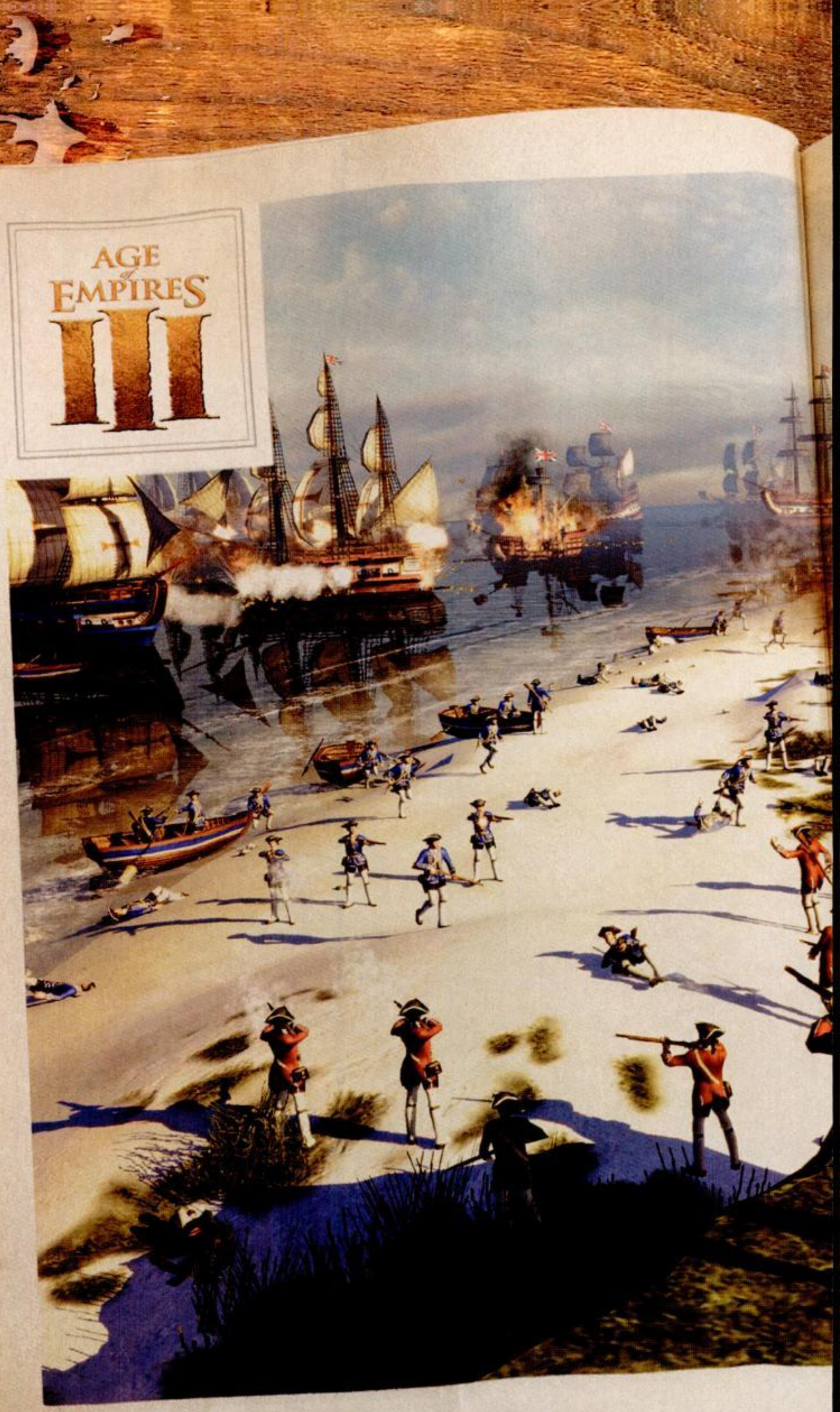

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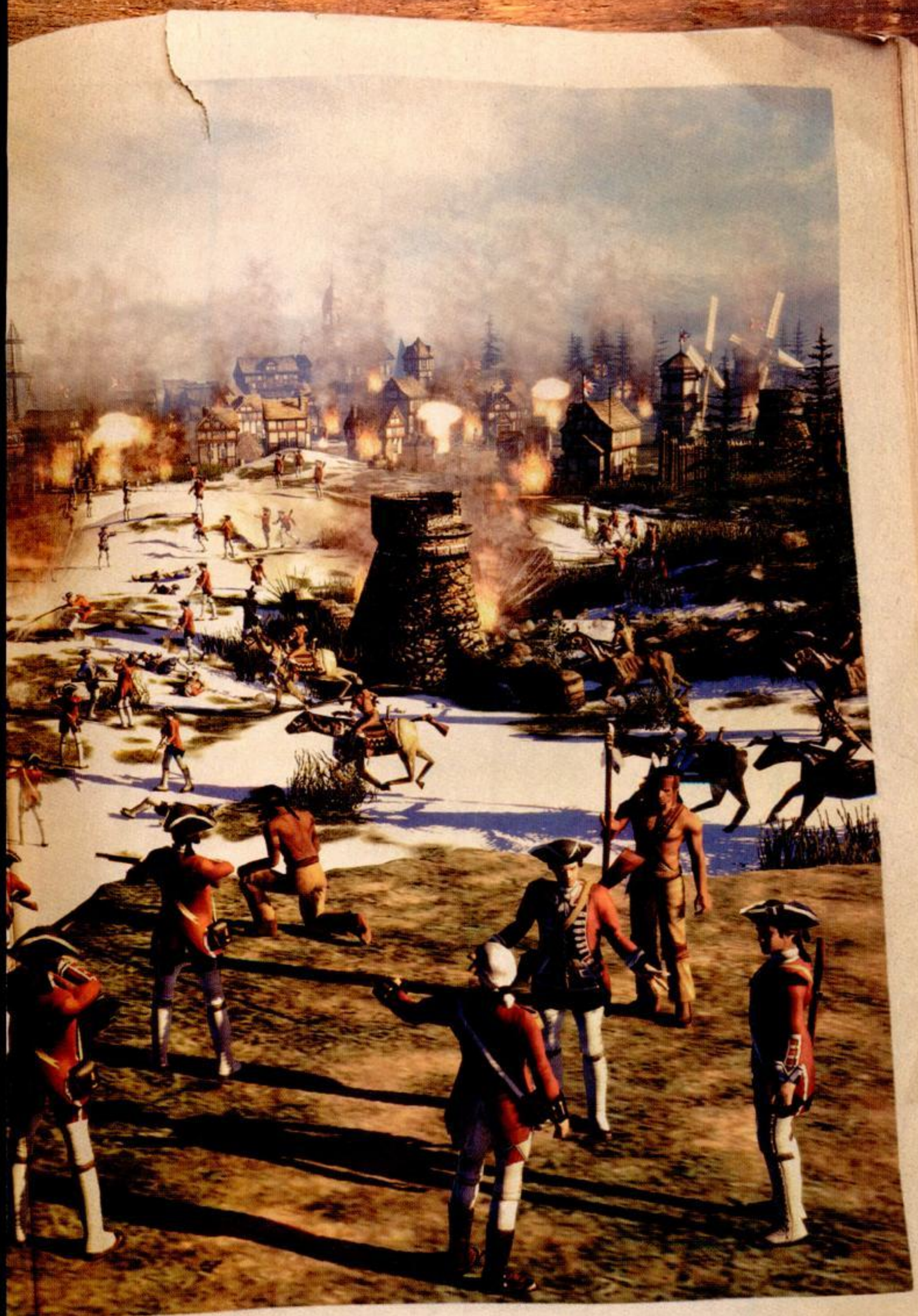

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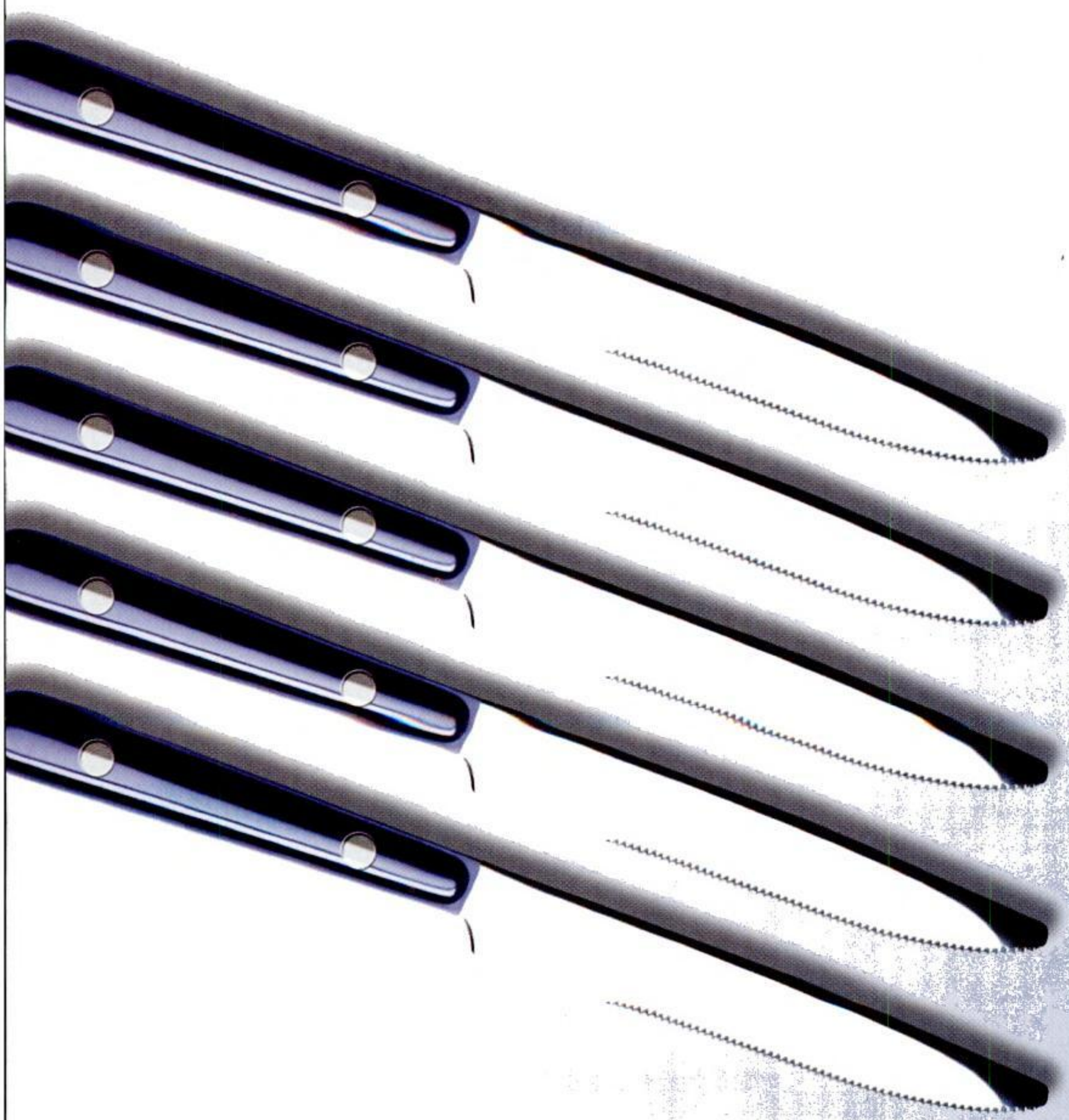

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Ed Word

Building for Katrina

I'm sure I'm not alone, but this last month, I've been unable to really concentrate on anything but the devastation wrought by Hurricane Katrina on New Orleans and the Gulf Coast. It's the worst natural disaster that's occurred in the U.S. during my lifetime, and it's unbelievable to me.

The one good thing that's come out of it is the incredible display of homegrown generosity. People around the country are opening their homes to Gulf Coast refugees, helping them find work, and giving of themselves in ways that I wouldn't have believed three months ago.

Even the kids are helping out. Our publisher's daughter, Elizabeth (aka Liz), set up a charity lemonade stand in front of her home and sold more than $300 worth of lemonade in one afternoon. We may not be lemonade-making masters, but we can sure as hell build kick-ass computers. Thus, we're building a pair of very special PCs—a lightning-fast mid-tower rig and a super-silent small form-factor machine—and selling them, with the proceeds going to Katrina relief.

That's right, for the first time, you'll be able to buy a rig built by the editors of *Maximum PC*. They'll be available on eBay in a few weeks, and we'll donate 100 percent of the proceeds to two of the charities helping victims of the hurricane—the Salvation Army and the Red Cross.

The specs aren't final yet, but I want to give you a hint of the goodness inside these boxes. The mid-tower rig will feature an Athlon FX-57 processor, a pair of GeForce 7800 GTX boards in SLI, a giant RAID 0 array, and a ton of memory. The quiet rig will include a Pentium M and a single GeForce 7800 GT board, both tweaked to run silently. We're ripping these ready-to-burn hardware configs straight from the pages of *Maximum PC*.

Both machines will feature one-of-a-kind paint jobs from Smooth Creations (the best case painters we've worked with) and will be hand-built, custom-tweaked, and signed by the editors. Truly, these are one-of-a-kind machines, and this is your shot to own a piece of *Maximum PC*. Now, we couldn't do this alone. We've lined up a ton of sponsors, who were kind enough to donate hardware, software, and time to our project. In next month's issue, we're going to profile both machines, and give you a close-up look under the hood, so you can see exactly what's on offer. As soon as the hardware is finalized, we'll post pics, a full spec list, and the auction info on **www.maximumpc.com**. Stay tuned.

Will Smith

Please send feedback and cake to ***will@maximumpc.com.***

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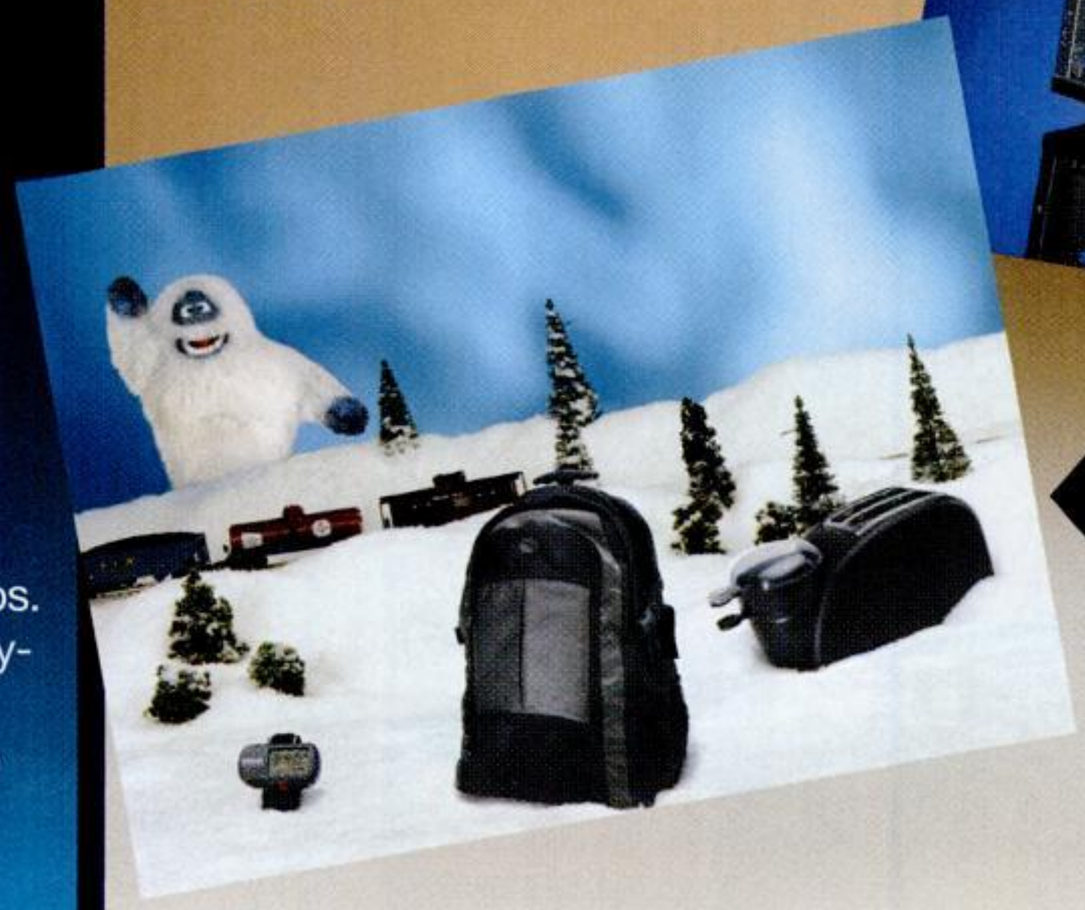

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After a grueling month plowing through acres of gadgets, we report on the best gifts for the geek in your life—even if that geek is you.

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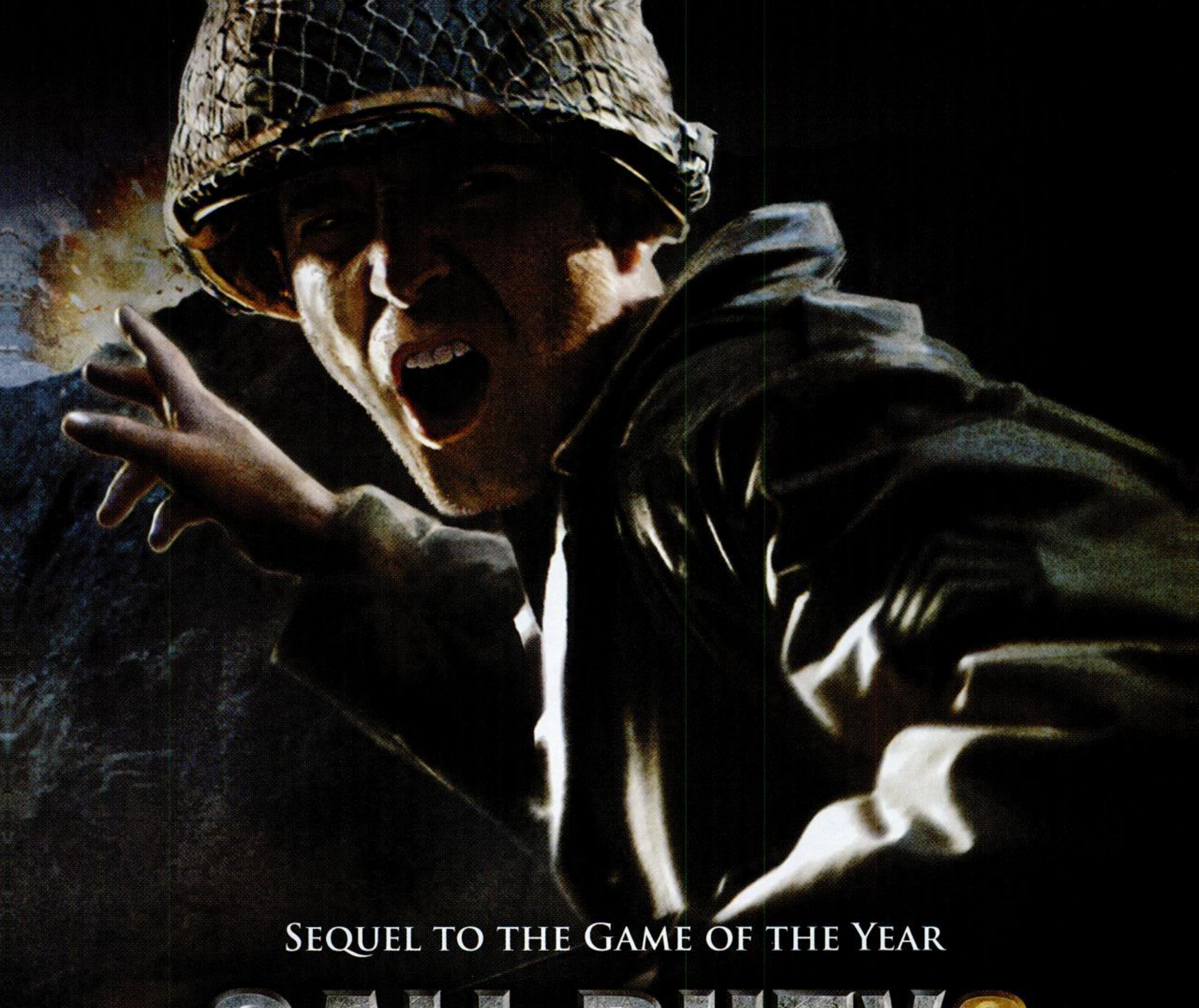

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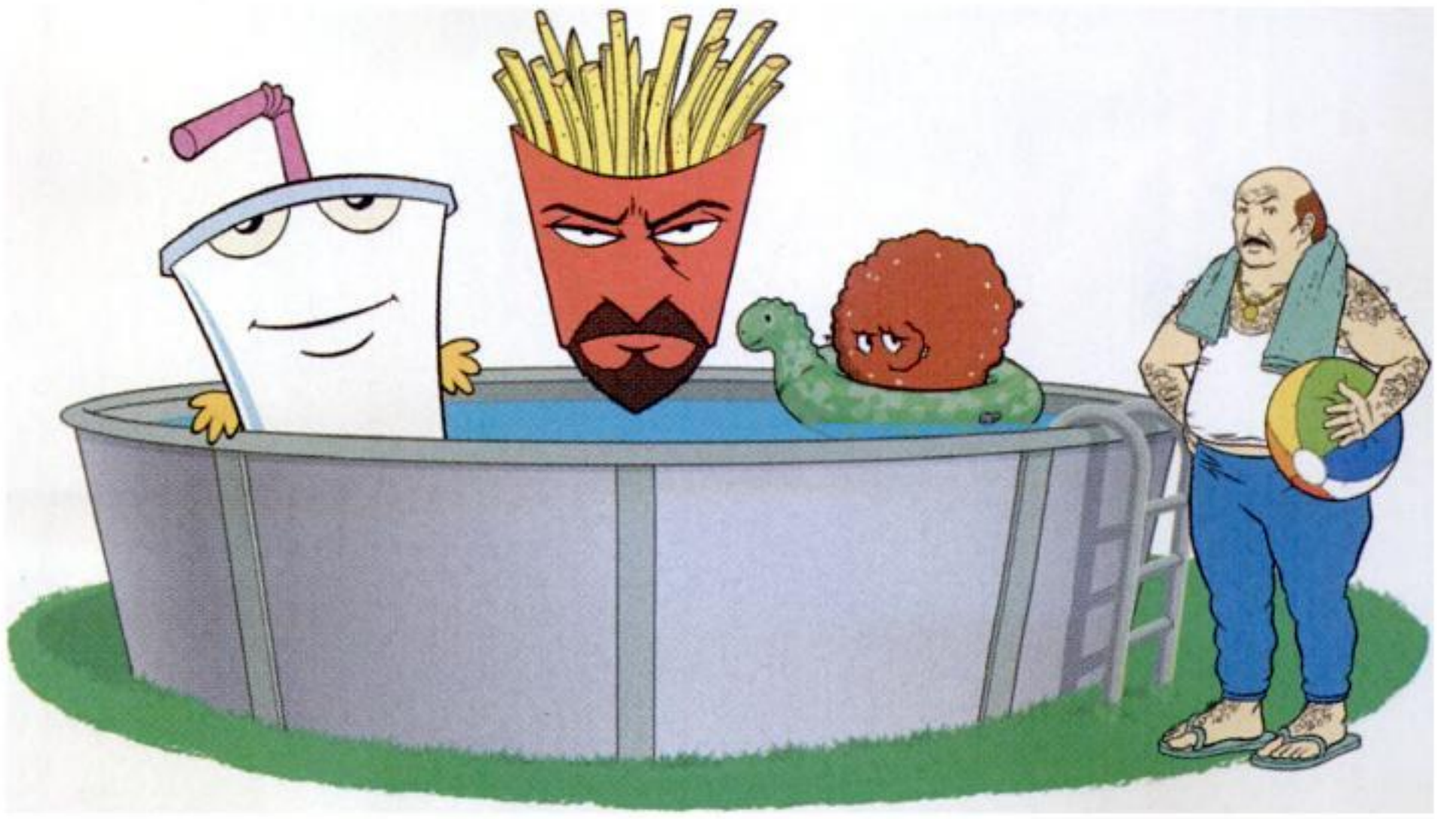
Get Your Kicks with Friday Night Fix

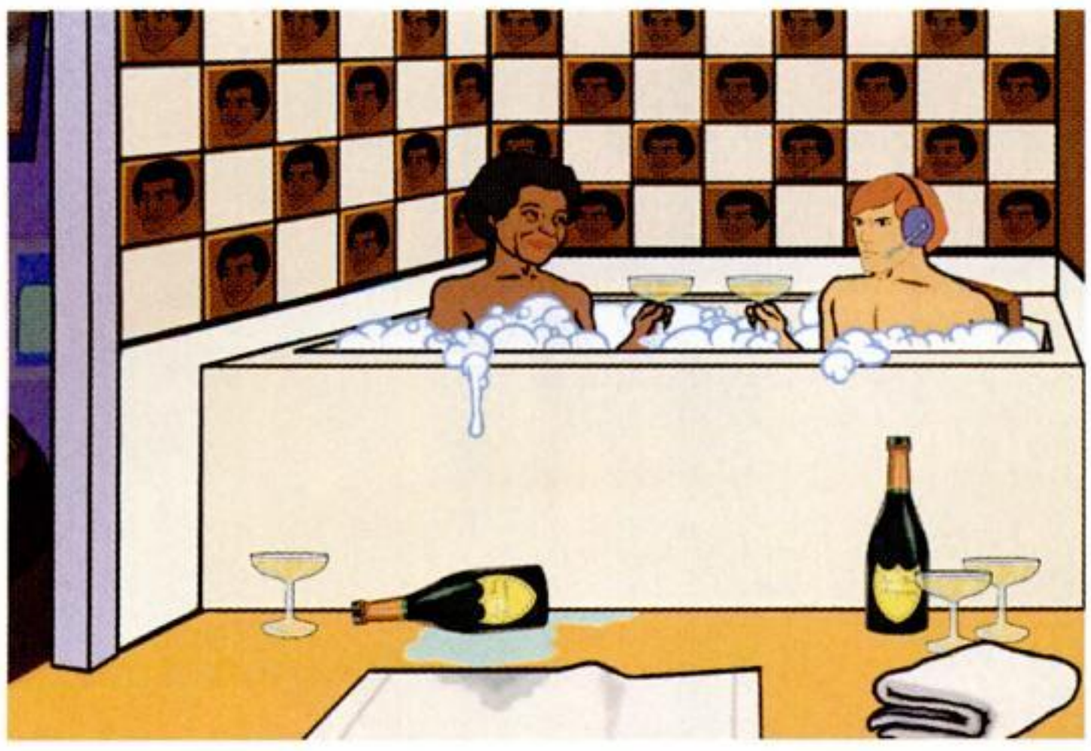


Put the kids to bed, and then kick back with *Aqua Teen Hunger Force* on your laptop.

As the Cartoon Network airs free streamed broadcasts over the Internet, Maximum PC wonders: Are content providers finally seeing the benefits of digital distribution?

Free broadcasts streamed over the Internet? It almost sounds like a trap. Yet that's exactly what's going on over at the Cartoon Network, where the channel's insanely popular Adult Swim program block, which runs from 11 p.m. to 5 a.m. Saturday through Thursday, will be streamed over the Internet on Fridays, for those who can't bear to go a day without *Aqua Teen Hunger Force*.

It's called Friday Night Fix, and it's one example of how the entertainment industry is beginning to acknowledge how the Internet can help television networks, music labels, and Hollywood studios bag new audiences for their content and build more loyalty among current fans. Paul Condolora, vice president and general manager of Cartoon Network New Media told *Maximum PC*, "[Friday Night Fix] is intended to attract a new group of users to our site, who will then experience other aspects of Adultswim.com, like games and our new social network dubbed the Fan Collective. Finally, we suspect there may be people who do not have cable TV, but might be able to access our shows on this platform."



In addition to the usual Adult Swim fare, the Cartoon Network intends to premiere new shows on Friday Night Fix.

It's not as if the entertainment industry has been unaware of the way the Internet can be used to promote and gauge the popularity of content, however. One of the recording industry's dirty little secrets is a company called BigChampagne, which monitors file-sharing networks and reports on what's being traded the most. What's more, BigChampagne gathers as much demographic information as is possible from the shared folders on users' hard drives—in essence, gathering valuable marketing data from the same file-sharing networks that the industry is actively trying to eliminate.

Wouldn't you know, there remains a vocal segment of the entertainment industry that's unhappy even with the legitimate distribution of creative work on the Internet. When the UK's BBC began making Beethoven symphonies available for free download over the Internet—a hugely popular program that netted 1.4 *million* downloads in a single month—recording-industry representatives whined that the downloads might cut into their commercial sales.

Ultimately, the entertainment industry is battling for the attention of audiences who are turning to the Internet in increasing numbers for their kicks; the result is a melting away of irrational fears about Internet distribution and free stuff. As Condolora put it, "At Cartoon Network, we believe in letting fans be as big of fans as they want to be.... We understand what it's like to be a fan, and we try to encourage that behavior on all media platforms."

Friday Night Fix began airing on September 16, and is streamed from Adultswim.com every Friday evening beginning at 11 p.m. (EST). You'll need *Windows Media Player* and parental permission to watch.

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32GB Compact Flash Cards?

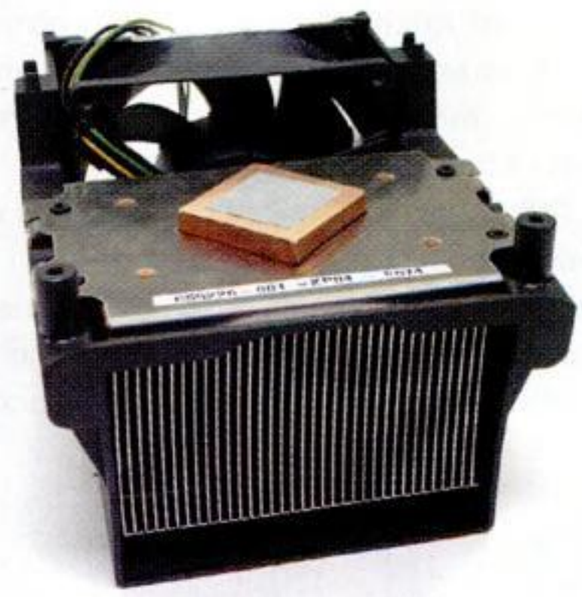
It sounds wild, but Samsung has developed a new ultra-high-density flash memory that could make such wildly audacious memory cards a reality in the near future. The new NAND chips achieve a staggering 16-gigabits-per-chip density, which is double that of the company's current highest-density NAND chips. The chips will go into production in 2006 and are made using a 50-nanometer process.

Bye-Bye, BTX

Intel's move to lower clock speeds could be the death knell for its fledgling BTX formfactor

Intel's recent announcement of its impending move to a low-wattage microarchitecture is good news for fans of quiet, cool-running PCs, but it begs the question: Where does this leave Intel's much-touted BTX formfactor?

Though BTX was designed to make communication between the north bridge and south bridge chips more efficient, its biggest boon has been improved airflow over the CPU area—a major concern with Intel's super-hot Prescott processors. Because Intel's new chips are designed to run much cooler (and because AMD was never going to embrace BTX), will the formfactor simply die a slow death? Rahul Sood, president of Voodoo PC, certainly thinks so.



Intel's new low-wattage microarchitecture will probably render the honkin' BTX cooling apparatus obsolete.

"I always thought BTX was a waste of time and energy," says Sood. Speaking of Intel's switch, he remarks, "It shows that Intel has re-evaluated its technologies and probably realized that AMD was going to roll them up and smoke them for the next year or two." Neither Dell nor Intel—both BTX supporters—responded to requests for comment as we went to press.

SATA II Confusion Nipped in the Bud

A new SATA spec consolidates new features into one easy-to-understand name

If you're confused about whether SATA II is a drive or a feature, or both, you're not alone. The ridiculous naming conventions for SATA drives and their associated features have caused widespread bafflement among the industry, and so the organization in charge of this stuff has announced an all-inclusive SATA spec dubbed SATA 2.5.

The new spec rolls all the previous specs—including those from SATA 1.0, 1.0a, 2.0, and beyond—into one. SATA 2.5 includes support for NCQ, port multipliers, QuickConnect cables, and so forth. The move makes it easier on drive manufacturers, who will now have only one spec to deal with for all the new SATA features. Unfortunately, a SATA 2.5 drive won't necessarily feature all the features listed in the spec, so be sure to read the fine print before you purchase a drive.

TOM
HALFHILL

Back to the Future

Intel's next-generation microarchitecture for future x86 processors resembles an old-generation microarchitecture—but that's OK. As expected, Intel and other companies are retreating from their reckless pursuit of high clock frequencies, and in some ways are reverting to designs reminiscent of the 1990s.

Note that a *microarchitecture* is a design for a microprocessor chip or processor core. Before Intel announced the next-generation microarchitecture, Internet rumors suggested that Intel would reveal a new *architecture*, which is nuts. Intel's crown jewel is the x86 architecture, which was born in 1978 and might outlive us all. Specific implementations of the x86—such as Intel's Pentium 4 or AMD's Opteron—have their own microarchitectures. Intel's next-generation microarchitecture will debut in processors code-named Conroe (desktops), Merom (notebooks), and Woodcrest (servers) in the second half of 2006.

An important microarchitectural feature is the number of stages in the instruction pipeline. Generally, the deeper the pipeline, the higher the maximum clock frequency, because each stage has fewer logic-gate delays. In addition, the pipeline depth influences other design points, such as branch-prediction accuracy, misprediction penalties, overall complexity, and power consumption.

The Pentium 4's NetBurst "hyperpipeline" has grown from 22 stages at introduction in 2000 to 31 stages today. In contrast, Intel's next-generation microarchitecture has only 14 stages. The Pentium M has 12 stages, the Pentium III (1999) had 11 stages, and the original Pentium (1993) had five stages. Clearly, the days of pipelines on Viagra have ended. But just because the new microarchitecture has only a 14-stage pipeline doesn't mean it isn't potent.

Although the shorter pipeline won't reach the orgasmic 10GHz clock speeds once predicted for 2011, it's simpler and wastes less power, so the chip runs cooler. Those characteristics are crucial for multicore processors, and multicore *is* the future. Furthermore, the new microarchitecture is better in ways that conventional benchmarks don't measure. It supports 64-bit extensions, Vanderpoole virtualization technology, LaGrande security, and new manageability features. Unfortunately, Intel jettisoned Hyper-Threading, which isn't incompatible with multicore design but does add complexity.

The 14-stage pipeline might seem like a step backward, but it's still deep by most standards. Intel's next-generation microarchitecture will bring us highly efficient chips with two, four, or more processor cores.

Tom Halfhill was formerly a senior editor for Byte magazine and is now an analyst for Microprocessor Report.

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GAME THEORY

THOMAS MCDONALD

To PC or Not to PC

I spent the past month doing my annual Game Immersion Ritual, in which I leap into a pile of games and swim through them like Uncle Scrooge going for a dip in his money bin, emerging with a list of the top 100 releases for the year. The PC-exclusive titles that made the list are few enough to repeat in full: *SWAT 4*, *Battlefield 2*, *Empire Earth 2*, *Act of War*, *Knights of Honor*, *Silent Hunter III*, *Freedom Force vs. the Third Reich*, and *Guild Wars*. Frankly, we could have done without every one of them.

Oh, the games were great, but we'd have done almost as well playing last year's versions. In some cases, we'd do better. *Battlefield 2*, for instance, took the wonderful, smooth experience of the old *Battlefield* and turned it into a painful bout of expensive hardware upgrades, with frankly nebulous net benefits.

My disappointment with this year may simply be a matter of timing. Warming up for late release is *Civilization IV*, *Age of Empires III*, *F.E.A.R.*, *The Movies*, *Black & White 2*, *Star Wars: Empires at War*, and *City of Villains*, all mandatory PC titles, at least for the foreseeable future. Of these, *AoE 3*, *Civ 4*, *B&W2*, and *City of Villains* are all strong, at least in their preview versions, and are known quantities. No real surprises. *F.E.A.R.* is shaping up to be this year's *Half-Life 2*, an ambitious FPS with a creepy *Ring* vibe. *Empires at War* may finally break the curse of the *Star Wars* strategy game, but I've said that before. As for *The Movies*, it looks good so far, but Lionhead games usually preview well, and often wind up less-than-best in the gameplay department.

Some other big games in the making—*Star Wars: Battlefront II*, *King Kong*, and *Quake IV*—are multiplatform, with the Xbox 360 versions perhaps delivering better performance than their PC counterparts. This of course will leave us once again wondering: Is this the year we forgo the $1,500 PC upgrade and simply cross over to the console dark side? I don't think so, but we'll know for sure in a few months.

Thomas L. McDonald has been covering games for 15 years. He's currently Editor-at-Large of the old-school game and puzzle mag Games.

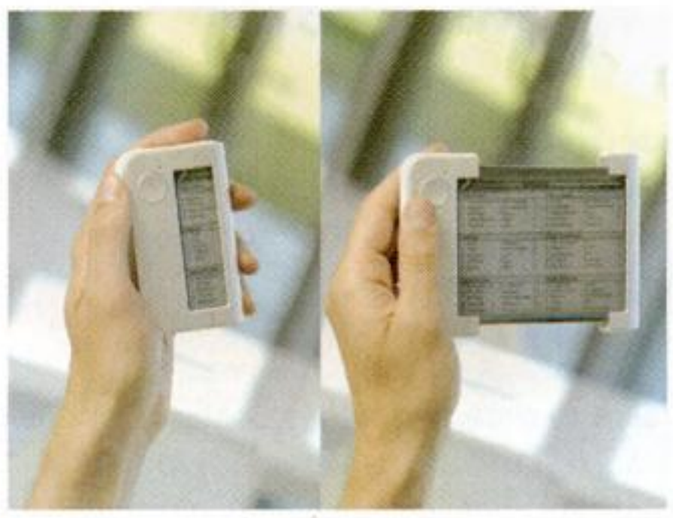
Need A Display? Roll Your Own!

Philips fast-tracks the flexible screen

The folks at Philips Research in the Netherlands recently demonstrated a working prototype of the "Concept Readius," an electronic-document reader featuring the world's first "rollable" display, which lets manufacturers roll a giant, full-size display into a tiny device.

The 5-inch screen displays four gray levels, and currently runs at a resolution of 320x240, using technology licensed from Massachusetts-based E Ink Corporation. The image is made up of thousands of microcapsules—each about the diameter of a human hair—that are dark on one side and light on the other. These microcapsules rotate as needed to create the image.

Although the Concept Readius is only a reference design at this point, it's a good sign that the flexible display may arrive sooner than anyone had anticipated and breathe new life into PDAs and e-Book readers overburdened by the size, weight, and power requirements of their screens.



The rollable display arrives sooner than expected, but still too late for the iPod Shuffle.

Intel Adopts SLI and CrossFire in Next-Gen Chipset

If you're considering making the move to a PCI Express motherboard, but aren't sure whether to spring for one supporting ATI's CrossFire dual-card tech or nVidia's SLI, Intel's next-gen chipset—dubbed 975X—will reportedly support both platforms.

According to an article in *DigiTimes*, Intel has reached licensing agreements with both nVidia and ATI to use their respective dual-card technologies, a surprising development given the hyper-competitive graphics-card market. The article quotes sources at Taiwanese motherboard makers, though Intel, ATI, and nVidia aren't talking about the 975X at this time.

Intel's new chipset will reportedly be paired with its new "Presler" core, which will be used in the Pentium Extreme Edition 955. This dual-core processor will be made using a 65-nanometer process and will support a 1066MHz FSB with 2MB of L2 cache per core.

Close Up: iTunes 5

Apple's slick media player gets a high five

Steve Jobs appears to be cracking the whip: Apple just debuted *iTunes 5*, an update to the company's free media player, which now allows PC users to sync their iPods with contact information from *Outlook* and *Outlook Express*. *iTunes 5* also adds folder support for playlists, and a more random-behaving "Smart Shuffle" feature. (Free, www.itunes.com)

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TESTED & GEEK APPROVED

A spin-off from LoveSac's line of "hardcore leisure" products, the GameSac can be upgraded with cup holders and pillows, and even zipped to another GameSac to accommodate an "oversize" gamer caboose.

The GameSac

It begins humbly, with a foam-like insert about the size of a small backpack. Punch it, kick it, hump it, and in a couple days it will expand to fill the washable 4-foot square canvas cover. As *Maximum PC* editors battling for "Sac time" can tell you, the plush, cushy GameSac is the ultimate in luxury for your butt. $265, www.gamesac.com

Another Browser Goes Gratis

First Shakespeare in the Park, now—free Opera!

Internet Explorer might have earned its embarrassing "hijack me" reputation, but it isn't looking so bad these days, now that *Firefox* has become the latest victim of hackers and the annoying pop-ups of rogue marketing agencies. Where is a web surfer to turn?

Until now, Opera Software's *Opera* browser hasn't been a viable alternative, carrying a $40 price tag for what most PC users are accustomed to getting for free. But by offering *Opera 8.5* as a free download with no add banners, the company now stands a chance of closing the gap between its rivals.

Like *Firefox* and the upcoming *Internet Explorer 7*, *Opera* offers tabbed browsing and pop-up blocking, along with unique features such as built-in voice recognition, text-to-speech, and a password manager that can store multiple logins for the same site.

Grab it at **www.opera.com**. And remember, the browser wars aren't over until the fat lady sings.

***Opera* is billed as "The Fastest Browser on Earth." Now you can find out for yourself at the irresistible price of free.**

Windows Vista is Coming–in Seven Editions?

Microsoft isn't commenting on the forthcoming versions of its next operating system, Windows Vista, but Paul Thurrott of Windowsitpro.com got his hands on some "insider information" that shows plans for seven versions of the OS. Of course, Microsoft will neither confirm nor deny any of this, and specifics will probably change prior to launch late next year, so take it with a grain of salt.

The most basic version will be called Vista Starter, and will be for emerging markets only (read: third-world countries). The next version will be Vista Home Basic, which will be similar to XP Home edition. It will include all the Windows security utilities as well as networking support and entertainment apps.

Then there's Vista Home Premium, an upgraded version of Vista Home with features analogous to Media Center Edition 2005. Next is Vista Pro, which will be targeted at businesses and include support for non-Microsoft networking protocols. It will also support Tablet PC extensions.

Finally we have Vista Small Business and Vista Enterprise, which are targeted at—you guessed it—small businesses and enterprise. What really matters, though, is the seventh version, dubbed Vista Ultimate, which will reportedly offer everything from Vista Pro and Home Premium, as well as exclusive features including a gaming performance tweaker, a Podcast-creation utility, and online access to downloadable movies, music, and games. Thurrott claims that internal documents state the goal of all these versions is to provide "a clear value proposition" for all customers, regardless of their expertise.

FUNSIZENEWS

BEWARE INKJET REFILLERS

If Lexmark has its way, anyone who opens the packaging for one of its inkjet cartridges will automatically agree to its terms of service, which—big surprise—doesn't allow the refilling of its inkjet cartridges. Reportedly, Lexmark will begin labeling its cartridges as "single-use only" soon, and if you violate that EULA, you can be sent to Gitmo for violating the contract. If you don't like this strategy, be sure to vote with your wallet.

SPYWARE FOR STALKERS

A spyware author was recently arrested for his *Jealous Lover* program, which spied on people with a key logger and other nefarious means. What's interesting is that the people who bought the program have also been arrested and indicted. One arrestee was indicted for cyberstalking and faces up to five years in prison.

FIREFOX HINDERS CYBERSLEUTHING

At a recent meeting of the High Tech Crime Investigation Association, cybersleuths groused about alternative browsers, citing how Mozilla and Opera make their jobs more difficult by keeping files in different locations than *Internet Explorer*. Also, the forensics software many sleuths use isn't always compatible with alternative browsers. Boo-frickin-hoo, investigators. Just learn the new browsers already!

SHAREHOLDERS SUE ATI

A class-action lawsuit has been filed against ATI by its shareholders, who allege that company bigwigs sold off more than $54 million in stock at "inflated prices" during the R520's delay. The stock price was inflated because nobody knew about the issues with the R520s design/production/yields. The suit was filed when ATI forecasted reduced fourth-quarter earnings by $20-to-$50 million, due to the chip's delay. Ouch.

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ATI's CrossFire **vs.** nVidia's SLI

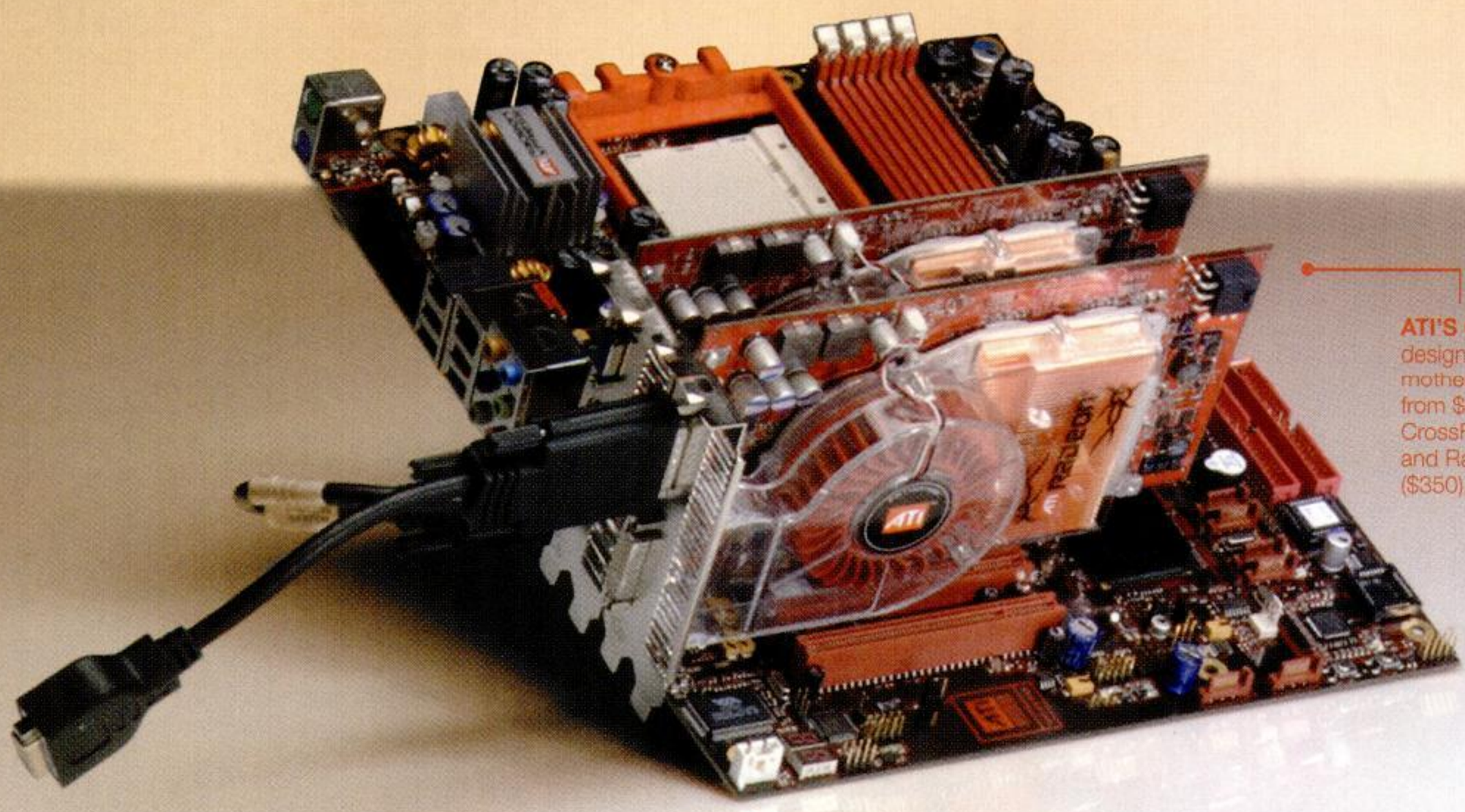
When you need to do something faster, nothing is more effective than doubling the amount of horsepower available to perform the task. And when it comes to making 3D games run faster, nothing has proven to be more effective than dropping two videocards in the same PC.

There's absolutely nothing new about this concept. 3dfx's Voodoo 2 graphics boards introduced the concept to consumer PCs in the 1990s, and nVidia brought the technology back into the mainstream with its SLI (Scalable Link Interface) technology in 2004. ATI is no stranger to the concept either—you'll find its GPUs in high-end flight simulators.

ATI, like nVidia, will rely on OEM partners to sell CrossFire motherboards, but consumers can buy CrossFire videocards directly from ATI or from third-party manufacturers.

We compared an ATI reference-design Radeon XPress 200 CrossFire Edition motherboard, an ATI Radeon X850 XT CrossFire Edition videocard, and a Sapphire Radeon X850 XT videocard to GeForce 6800 Ultra, 7800 GT, and 7800 GTX cards running in SLI in an Asus A8N-SLI Deluxe motherboard, to determine which technology is superior.

BY MICHAEL **BROWN**



ATI'S CROSSFIRE: Reference-design CrossFire Edition Socket 939 motherboard (retail boards range from $80 to $120), Radeon X850 XT CrossFire Edition videocard ($350), and Radeon X850 XT videocard ($350), **www.ati.com**

round 1 SPECIFICATIONS

The Socket 939 CrossFire Edition motherboard we reviewed is based on ATI's RD480 chipset and features an 800MHz/1GHz HyperTransport bus, support for DDR1 400 memory, SATA 1 and SATA 2 RAID controllers, a gigabyte Ethernet controller, and integrated Intel HD audio.

ATI's 16-pipe, 256MB Radeon X850 XT CrossFire Edition videocard was the only CrossFire card available at press time. We paired it with Sapphire Technology's Radeon X850 XT videocard. (We'll test the company's 16-pipe X800 XL and eight-pipe X800 CrossFire Edition cards as soon as they're available.)

The fact that nVidia can deliver SLI solutions today with 8-, 16-, 20-, and 24-pipe GPUs gives the company an obvious edge in this category. We'll have to wait and see if ATI's R520 GPU can alter the equation. **WINNER: SLI**

round 2 EASE OF INSTALLATION

Videocard pairs in SLI and CrossFire systems both depend on inter-GPU communication to divvy up the rendering workload. nVidia's GeForce 6600 and 6600 LE use the PCI Express bus to share synchronization, display, and pixel data; nVidia GPUs from the GeForce 6600 GT on up require a bridge board.

The GPUs in all CrossFire cards communicate via the PCI Express bus, but the "slave" card transfers its renders to the "master" card using a three-headed cable outside the case (one end plugs into a proprietary DMS-59 connector on the master card, one end plugs into the slave card's DVI output, and the third connects the master card to your monitor). Both solutions are equally annoying kludges rendered necessary by inadequate bandwidth across the PCI-E bus. **WINNER: TIE**

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round 3 FLEXIBILITY

Aside from sheer performance, the most attractive feature of a dual-videocard motherboard is that you can buy a single card now, and drop in a second one down the road. ATI's CrossFire solution trumps nVidia's SLI on this score: You can pair one videocard from any manufacturer with a CrossFire edition card from any other manufacturer. You can run two cards with different clock speeds, too—each card will run at its native speed.

With nVidia's solution, both cards must come from the same manufacturer, run at the same speed, and be outfitted with the same BIOS. CrossFire's flexibility, however, isn't entirely without drawbacks: If you pair a 16-pipe Radeon X850 CrossFire Edition card with a 12-pipe Radeon X800, for example, the CrossFire board will shut down four of its pipes. **WINNER: CROSSFIRE**

round 4 SLOT DESIGN

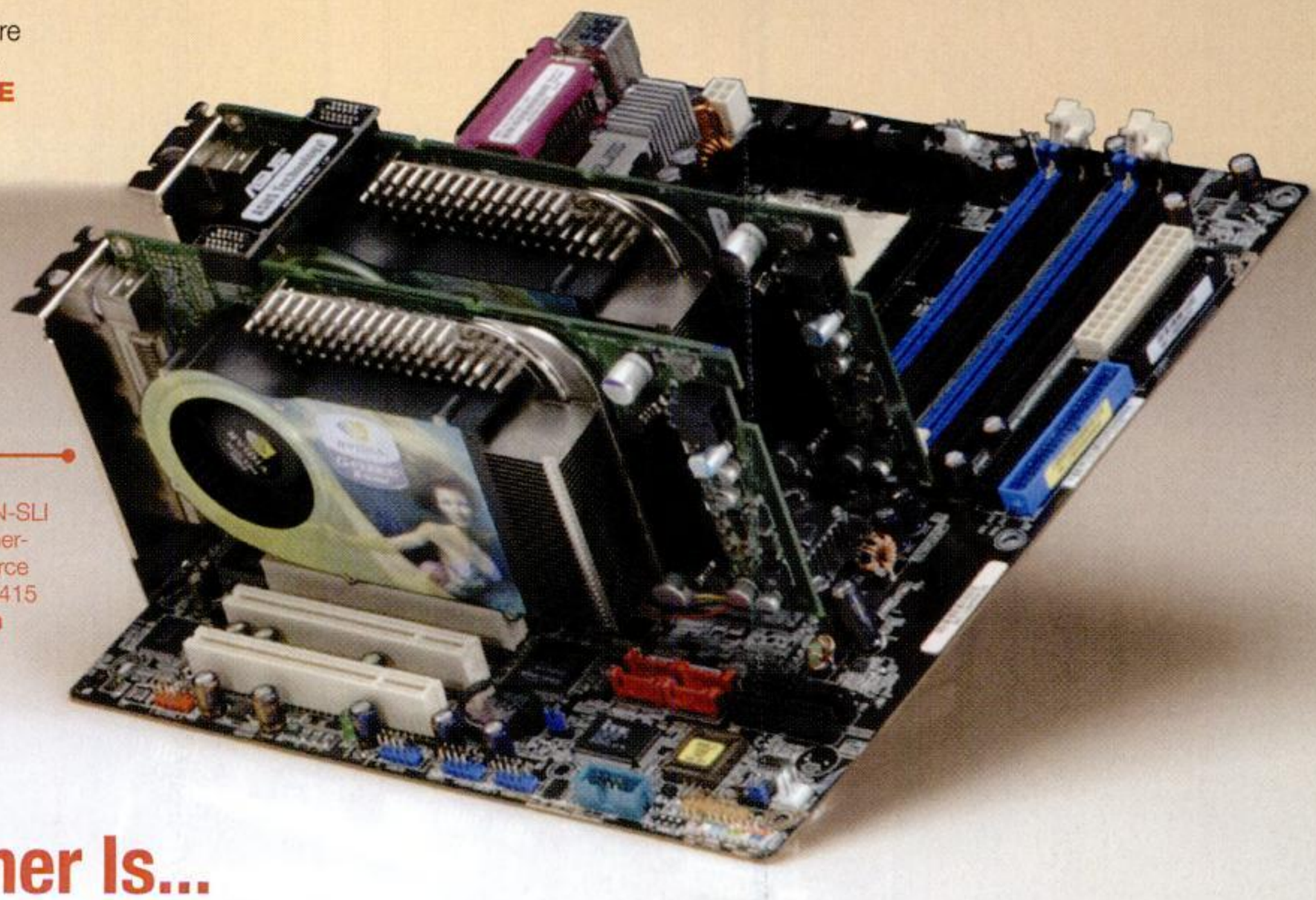
The PCI Express slots in both SLI and CrossFire Socket 939 motherboards must be configured to function as either one x16 and one x4 slot (in single videocard mode) or as two x8 slots (when two videocards are installed). You accomplish this on some nForce4 motherboards, including the Asus A8N SLI Deluxe mobo we used, by reorienting a small PCB on the motherboard. This process can be a royal pain in the ass, but it's superior to ATI's brain-dead solution.

On the CrossFire mobo we tested, you have to insert a PCB into the vacant PCI Express slot, endowing one slot with 16 lanes and rendering the other entirely useless. ATI's technology looks even lamer in the face of nVidia's new nForce4 Intel Edition chipset, which enables 16 lanes in both PCI Express slots. **WINNER: SLI**

round 5 PERFORMANCE

Although ATI is positioning the Radeon X850 XT CrossFire Edition against nVidia's GeForce 6800 Ultra, no one seems to be making 6800 Ultra cards these days—nVidia's GeForce 7800 GT has clearly taken its place. But for the record, two X850 XT cards in CrossFire mode are indeed roughly equivalent to two 6800 Ultra cards in SLI. Dual 7800 GTs, on the other hand, mopped the floor with ATI's top-of-the-line CrossFire combo; while a pair of 7800 GTX cards blew past ATI's offering without even breaking a sweat.

For an in-depth look at SLI vs. CrossFire performance turn to In The Lab on page 70. **WINNER: SLI**



NVIDIA'S SLI: Asus A8N-SLI Deluxe Socket 939 motherboard ($165), dual GeForce 6800 Ultra videocards ($415 each), **www.nvidia.com**

And the Winner Is...

ATI has had nearly a year to study nVidia's dual-videocard efforts, and yet this first generation of CrossFire technology is far slower and much less sophisticated than even nVidia's second-tier SLI offering.

We hope ATI's motherboard partners will figure out a way to split the PCI Express lanes in the system BIOS, because the reference-design solution that effectively configures the lanes as x16/x *zero* in single-card mode is mind-numbingly dumb. Even if they do, however, it won't make up for the fact that you remain limited to an x8/x8 configuration in CrossFire mode.

We do, on the other hand, appreciate that ATI allows us to mix and match a CrossFire Edition videocard with any other videocard in the Radeon X800/X850 family, no matter which manufacturer made the cards. nVidia's upcoming Forceware release 80 will finally let you run cards from different manufacturers in SLI, but both cards will still need to be outfitted with identical GPUs.

In the end, however, we find absolutely no reason to buy a CrossFire Edition motherboard and videocard today—especially as you won't be able to couple any of the current-generation Radeon videocards with an R520-based card. We'll revisit CrossFire as soon as ATI ships an R520 version; but for now, nVidia's SLI rules the dual-videocard roost.

Be sure to check out "In the Lab" on page 70 of this issue for more information on our CrossFire experience. You'll find detailed benchmark results there, too.

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Antec's all new P180

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*Freya, **Watchdog of the month***

IPOD BAD BATTERY SETTLEMENT

A federal judge has approved a $100 million settlement in a class-action lawsuit against Apple that claimed many iPod batteries failed prematurely. Consumers who purchased first-, second-, and third-gen iPods before May 31, 2004 may be eligible for an extended warranty, replacement battery, or store credit from the company. The settlement could apply to as many as 2 million iPods. Owners of third-gen iPods will likely receive a one-year extension to the warranty to cover the battery. If the battery fails within that period, the consumer could have the battery replaced at no charge other than shipping and handling, or they could receive a $50 store credit. Owners of eligible iPods whose batteries failed may receive a $50 store credit or a check for $25. Consumers who already had their batteries replaced within two years of purchasing the iPod may receive a check for 50 percent of the amount they paid. More information is available at: www.appleipodsettlement.com.

GAINWARD GIVES U.S. CUSTOMERS THE GOLDEN SHOWER

I have a Gainward graphics card with a faulty fan. I obtained an RMA and sent the card to the company. A week later the box came back—unopened and with the same tape I sealed it with!

*When I contacted Gainward again, I was told: "Gainward USA no longer handles RMAs, please contact Gainward Taiwan for further assistance." And sure enough, when you go to **www.gainwardusa.com**, a message on the site confirms this. (This message was not there prior to me sending my package out, by the way.)*

I then contacted Gainward Taiwan for support, and was told I'd be issued an RMA. The thing is, I told them that what happened was unacceptable—I paid money to ship the product out only to have it sent back in the same defective (and unopened) condition it was in. And not one person had bothered to contact me and help this matter move forward, they simply sent the package back.

Gainward's response to my problems was simply: "Sorry for your troubles, please request an RMA." This was not good enough for me. I told them I could not pay for shipping to Taiwan ($20+), especially after paying for shipping to the U.S. facility just to have it returned to me. But my words fell on deaf ears—the company did not respond to the email nor the three others I sent. They're ignoring me now.

This service is unacceptable and I would never recommend Gainward to anyone, nor will I ever buy another Gainward product in the future. I am stuck with a dead card that's probably not even worth the cost of shipping it to a foreign country.

—Dan Corritore

Gainward, the company that made the phrase "Golden Sample" synonymous with highly overclocked videocards rather than random steroid testing, hasn't been doing so well. Besides being squeezed by growing competition in the videocard market, the company has been in disarray most of the year, following a report on tech news site DigiTimes that Gainward would exit the business and sell its brand name. That report was later disputed, but Gainward did split from investor TNC Industrial.

As part of the split, the new Gainward announced plans to move its headquarters from Taiwan to Germany and open sales offices in the UK, Sweden, Russia, and France. What about the U.S.? That's not clear right now, but from what the Dog can tell, Gainward's presence in the States is nonexistent. At one point, the U.S. website said Gainward had discontinued support in the U.S. and referred consumers to Taiwan. Now the site is dead and all phone numbers for the company are disconnected.

So where does that leave you? Without any promise of support for Gainward products on store shelves, the Dog recommends that you steer clear of the brand. Consumers who already own a Gainward card, can only pray it doesn't break.

For you, Dan, there is a solution that doesn't require chucking the card. Although it'll cost you more cash, there are several after-market fans that should work on your videocard. The Dog is particularly found of Zalman's VGA Cooler. Woof.

WHERE IS MY MISSING CHANNEL?

Hewlett-Packard is selling its R4000 and ZV6000 Socket 939 Athlon 64 notebooks with one channel of their dual-channel memory controllers disabled. What's worse, nowhere on HP's website does it state that these systems run single-channel DDR. Anyone researching a system, whether it be a desktop or notebook, would discover from AMD's Athlon 64 white papers that the CPU's built-in memory controller is dual-channel.

Is there any way you can look into this issue for the many people who have purchased these tainted notebooks?

—Mark

The Dog spoke to a Hewlett-Packard spokesperson who looked into Mark's question. She confirmed that certain HP notebooks do indeed use a dual-channel CPU such as the Athlon 64 4000+ in single-channel mode. Why? The spokesperson said HP chose to do this because of the "limita-

Got a bone to pick with a vendor? Been spiked by a fly-by-night operation? Sic The Dog on them by writing **watchdog@maxumumpc.com.** The Dog promises to answer as many letters as possible, but only has four paws to work with.

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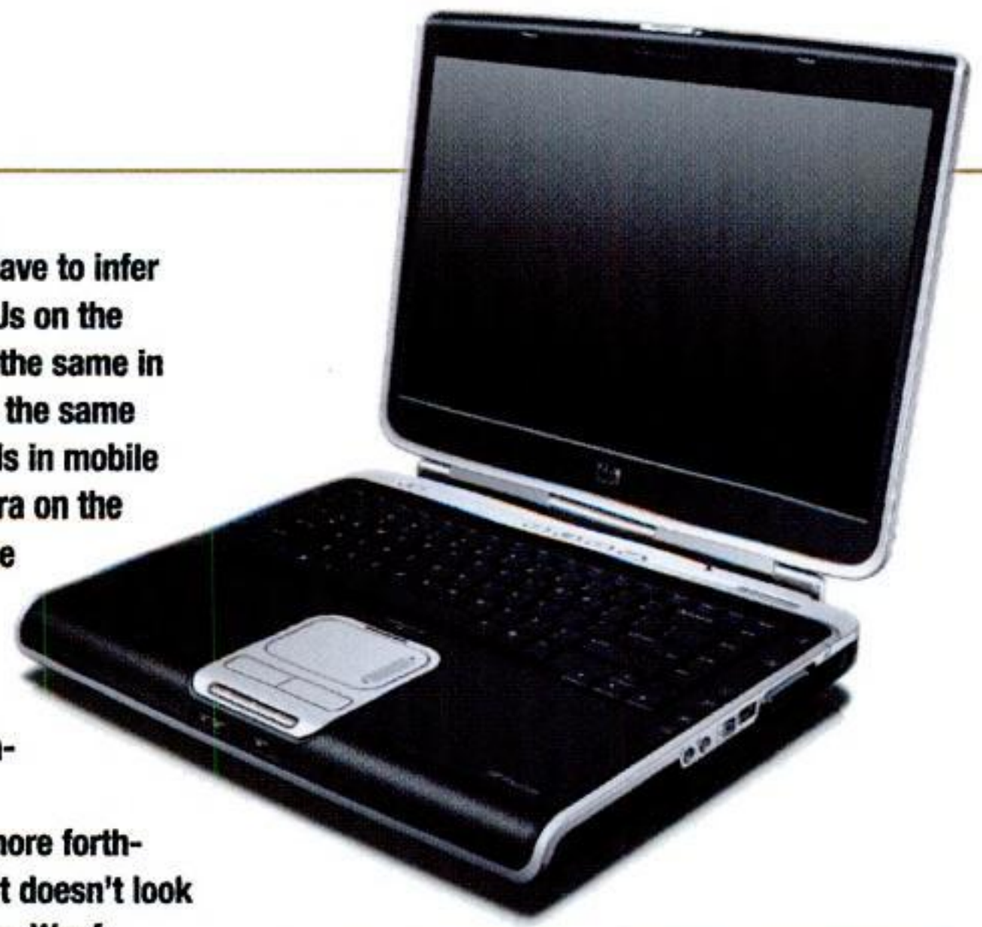
tions when trying to support dual-channel configurations." She added: "Although the memory brand does not need to match, the memory density and memory card configuration must be identical for the full memory amount to be used properly. If this rule is not followed, you are left with either a slight increase, no increase, or even a possible decrease in overall memory capacity. We decided that these limitations and requirements were too complex and were detrimental to the overall customer experience. In order to guarantee that customers always get the full amount of memory they paid for, our only choice was to use a single-channel configuration.

"These limitations aren't as big a concern for desktops, due to the extra number of memory slots they have (four or more). [Engineers] are able to lay out the motherboard so the user can get different memory configurations by plugging the memory into different slots."

So, Mark, there's your answer. Is it right? It certainly makes memory upgrades easy for the uninitiated. But if you're out for the ultimate in memory bandwidth performance, it's not ideal. The sticky thing is that while HP doesn't say the notebooks run in single-channel mode, the company also doesn't advertise (at least from what the Dog could find on its website) that the notebooks are dual-channel, either. You would have to infer that because all Athlon 64 4000+ CPUs on the desktop are dual-channel it must be the same in notebooks. You could probably make the same accusation of the nVidia and ATI cards in mobile products. While the GeForce 6800 Ultra on the desktop is a 16-pipe part, the GeForce Go 6800 Ultra is just a 12-pipe part. Similarly, many OEM versions of PC parts could also be lacking features that their retail counterparts carry.

The Dog believes HP should be more forthcoming about the configuration, but it doesn't look like a case of blatant false advertising. Woof.



HP says it disabled one memory channel on the dual-channel-capable Athlon 64 chips in its ZV6000 notebooks because of the limited RAM-configuration options in portable PCs.

PSU MADNESS

I bought a power supply not too long ago and found a sticker on it that says "Hi-Pot OK." Is this their QA, or what? I was wondering if they are trying to tell me something.

—Kenny Risch

Sorry to disappoint you and Jeffrey Lebowski. "Hi-Pot OK" has nothing to do with marijuana—it refers to an electrical test conducted on the power supply transformers. According to PC Power and Cooling: "Hi-Pot is a safety test to insure that a user will never be shocked with live AC when touching the computer case or any of the components. The high-voltage insulation is checked by applying 1500 VAC between the AC Hot receptacle and chassis ground to insure complete isolation." MPC

demonic possession

de•mon•ic (dĭ-mŏn′ĭk)
adj. pos•ses•sion (pə-zĕsh′ən)

- BEING COMPLETELY CONTROLLED BY *passion* OR THE SUPERNATURAL
- A *mania* RESTRICTED TO ONE THING OR IDEA AT THE EXCLUSION OF ALL ELSE
- MOTIVATED BY A *spiritual* FORCE OR GENIUS; INSPIRED
- THE STATE OF A HUMAN BODY UNDER DEMONIC *influence*, WITH THE INTENTION OF USING IT FOR *punishment* OR A TEST.

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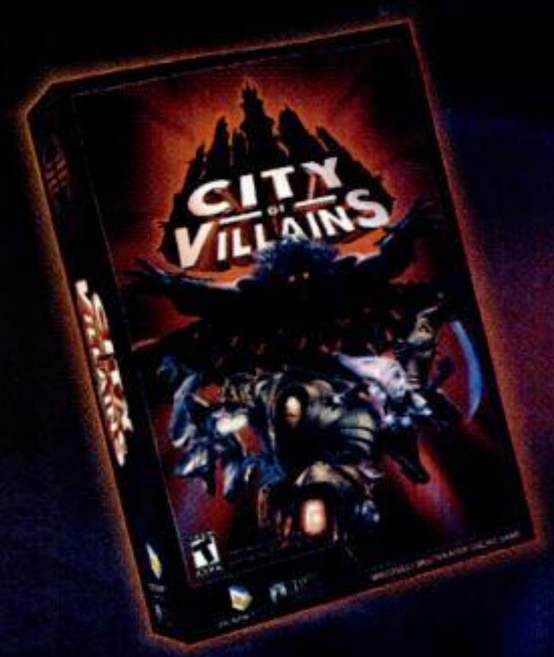

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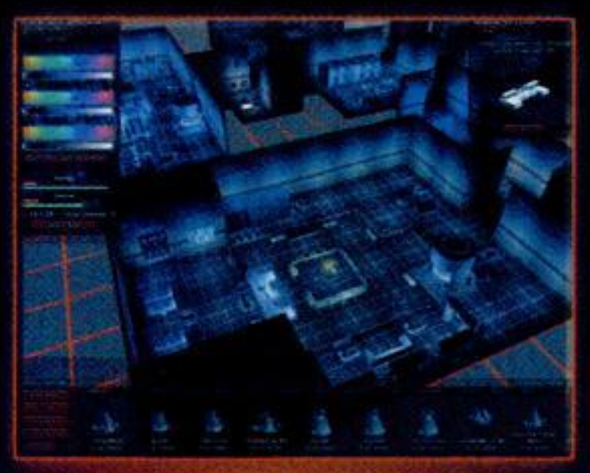

BUILD MASSIVE FORTRESSES ROOM BY ROOM

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Upgrade

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BY THE MAXIMUM PC STAFF

Upgrading your PC is a lot like learning to drive. It's not difficult, but the results can be disastrous if you don't follow the proper procedures. We urge you to read this story and spare yourself an expensive and heartbreaking upgrade gone bad. Our step-by-step instructions show you the very best way to upgrade every one of your PC's major components. Here's a tip: Before you start a component upgrade, read the guide for that component completely through; that way, you'll be prepared for what's to come and you'll be less likely to skip a crucial step by mistake.

Trust us—we've fried enough hardware to know right from wrong when it comes to upgrading. Learn from our mistakes and get your new, improved rig up to speed faster than ever before!

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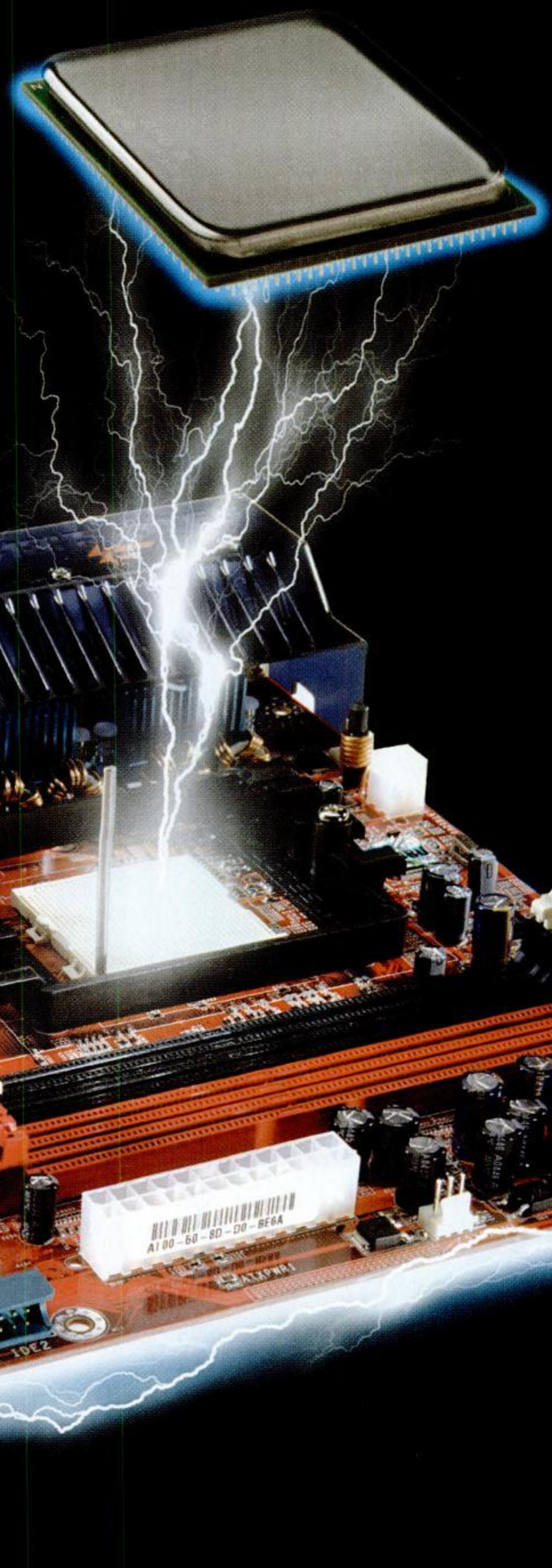

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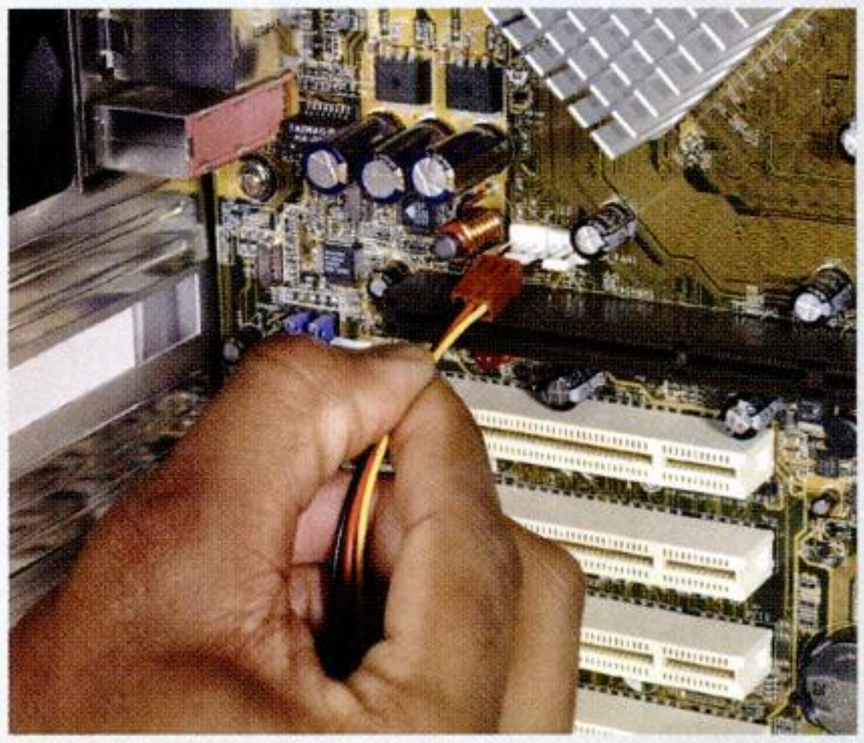
Upgrade Your Motherboard Step-by-Step

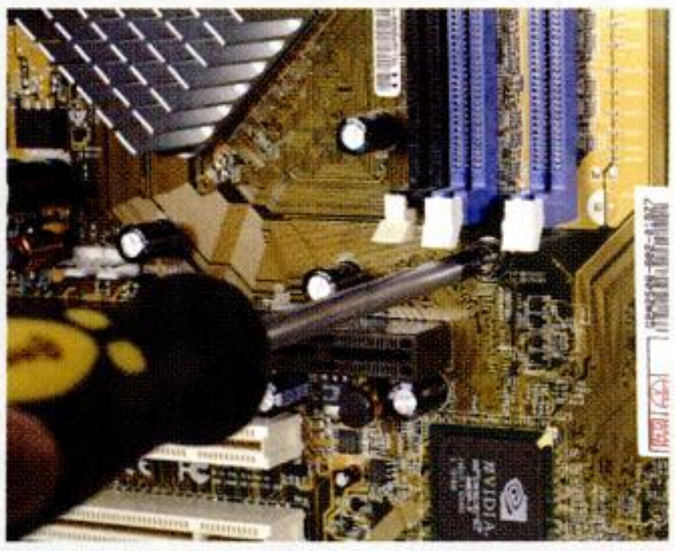
Because the motherboard is the foundation of your entire PC, upgrading it provides many opportunities for you to thoroughly screw up your rig and crush your spirit. But it doesn't have to be that way. All you need is paper, a pencil, your new mobo, and a Phillips screwdriver.

1 Make sure you're grounded before you touch any components; it's as easy as touching the metal portion of your case while the machine is still plugged in. Remove all your old add-in cards and memory, storing your components in antistatic bags while they're out of your rig.

2 Unhook all power cables, drive cables, and any case-fan power connectors from the motherboard. Unplug the wires connecting your case's front-panel power and reset buttons, too.



3 Most cases use several Phillips-head screws to hold down the motherboard. Unscrew each of them, and then carefully lift the mobo out of the case.

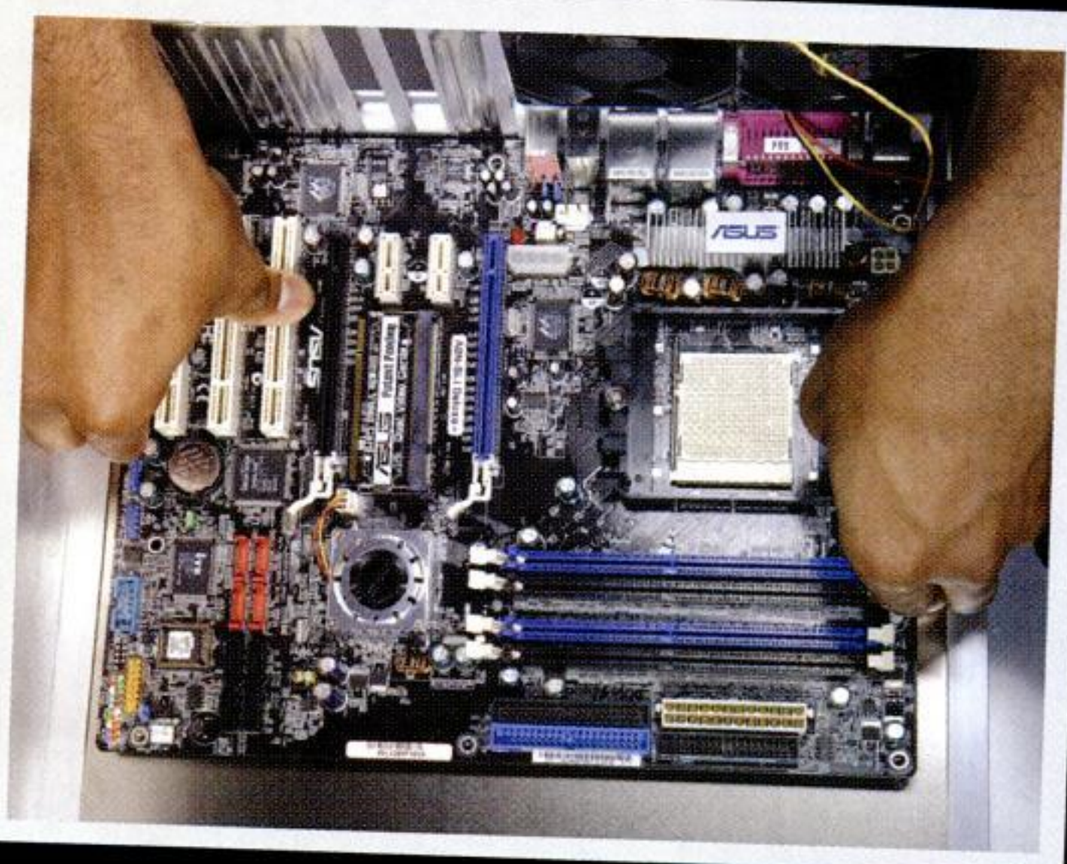


4 Remove the mobo's old I/O shield from your case. A quick thwack with the handle of a screwdriver will pop the shield right out.

5 When installing the new I/O shield, make sure all the knockput panels have been removed, and that the holes match your motherboard's ports. You should also ensure that the grounding contacts atop the PS/2, NIC, and FireWire ports are bent up so they won't get jammed into the ports when you install the new mobo.

6 Before you mount your new motherboard, count the mounting points in your case and write the number down on a piece of paper. If there are more or fewer mounting points on the mobo than in your case, adjust the standoffs in the case to line up with the mobo before you drop it in the case.

7 If you haven't already installed your new CPU and heatsink, turn to page 30; otherwise, you're ready to mount your mobo inside the case. Hold the board over the case and match the case's mounting points with the holes in the motherboard. Shift the board slightly until they're perfectly lined up.



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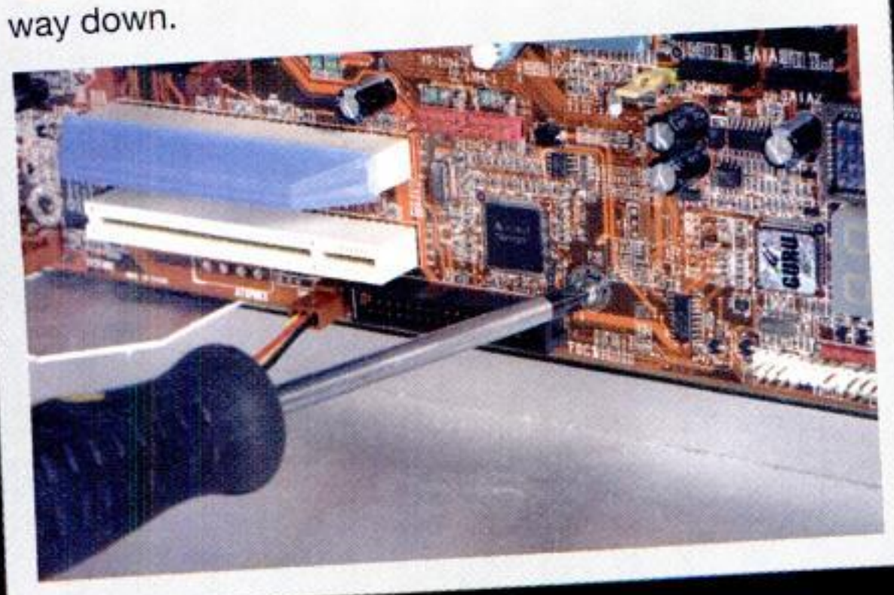
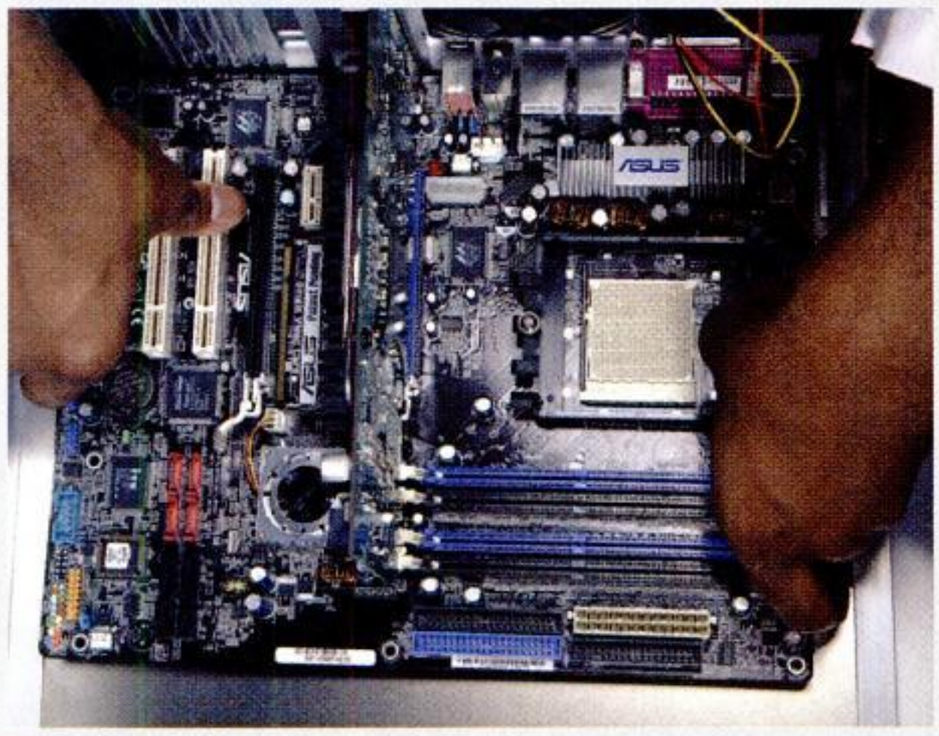
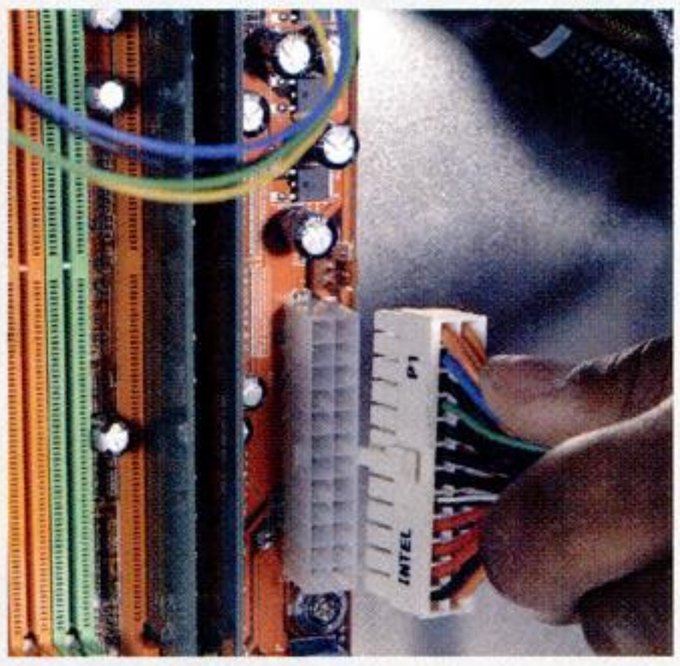
8 With the mounting points set up, carefully lower the board into place. Insert the screws and hand-tighten them, but don't screw them all the way down.



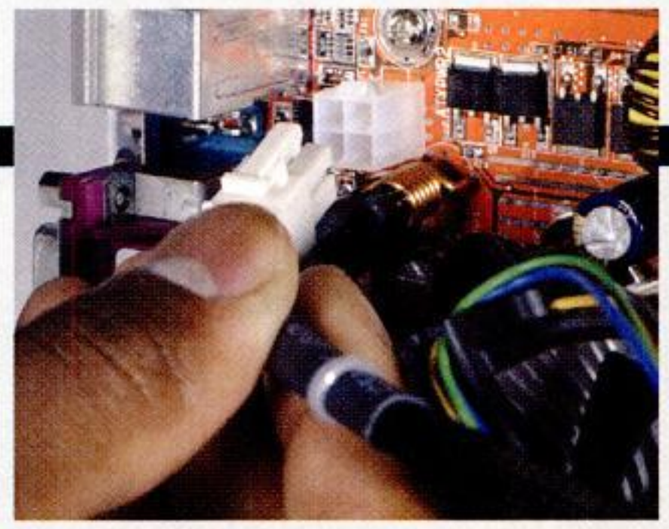
9 Install an expansion card into the board to check the spacing—nudge the board around until the card is easy to insert and remove.



10 Screw down the board, using enough torque to keep the screws from vibrating out, but not enough to crush the PCB. When you're done, count the number of screws you used. If the number doesn't match what you wrote down earlier, you missed a mounting point that could short out the underside of your board. Pull the board and locate the missing mount point.

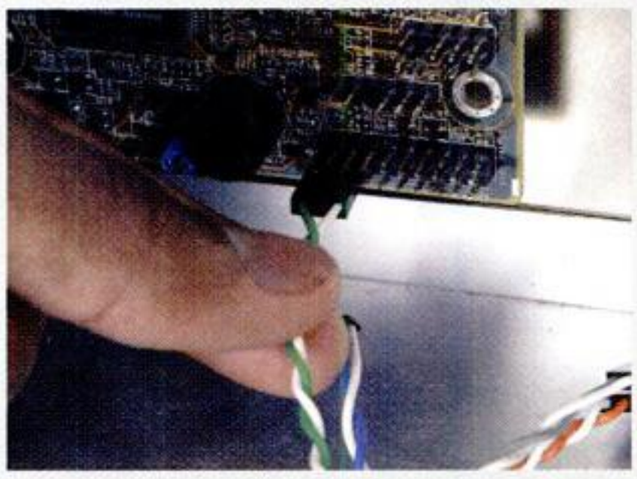


11 Plug the power and drive cables back into the board. If you're moving from an older AGP motherboard to one that supports PCI Express, your existing power cable won't match the new mobo (the cable is keyed to fit only one way, however, so don't force it). Newer motherboards have a 24-pin power connector, but it's not necessary if you have a good power supply. If you're *certain* your 20-pin power supply delivers enough juice, insert the 20-pin plug into the 24-pin jack on the motherboard. This will leave four open pins on the motherboard jack, which would otherwise supply power to the graphics card.

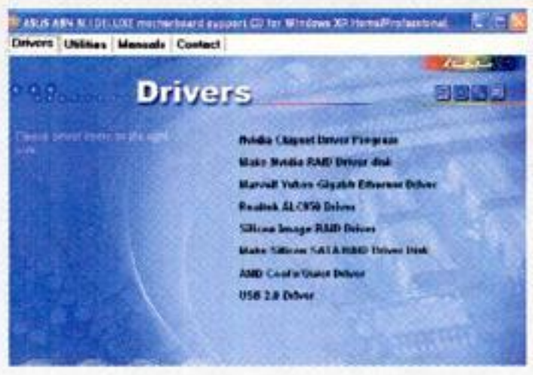


12 Connect the four-pin ATX12V plug. If your PSU doesn't have the square plug, it's really time to buy a new power supply. If your machine sporadically crashes while playing games or doing heavy computation, your PSU might not be providing enough juice; if that's the case, you'll need to purchase and install a new one (see the bottom of page 33).

13 Plug in the front panel I/O, add-in cards, and memory. You'll find directions for connecting the front panel I/O in your motherboard manual (each mobo is different, so consult your documentation). If you're sure you've connected the correct jumpers, but the hard drive or power light won't turn on, you probably have the polarity reversed. Reverse the connector and you should be good to go.



14 Boot the computer. Because you've just replaced a major component, you should really do a clean install of your OS. Even if you don't, Windows XP's activation "feature" might force you reactivate the OS. Whether or not you do a clean install, you'll need to install the chipset and device drivers for your particular motherboard.



15 You're almost done. Go into the motherboard's BIOS and set the proper boot order (typically optical drive first, then hard drive, and then any other bootable devices you have). You should also double-check that the mobo correctly detected your CPU and that the front-side bus and RAM are running at the proper speed. Each motherboard model is a little different, so you should consult your documentation for the full scoop.

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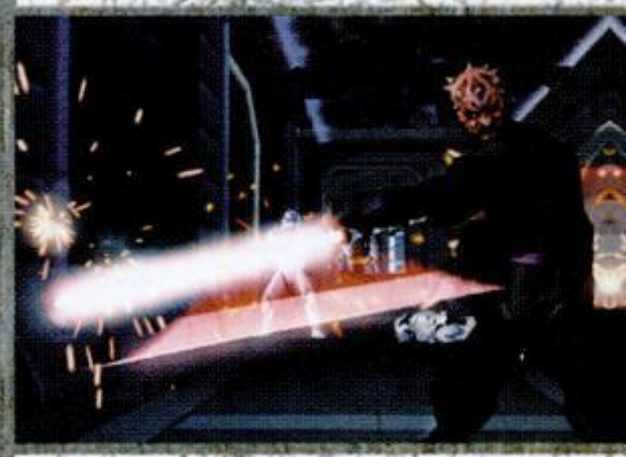

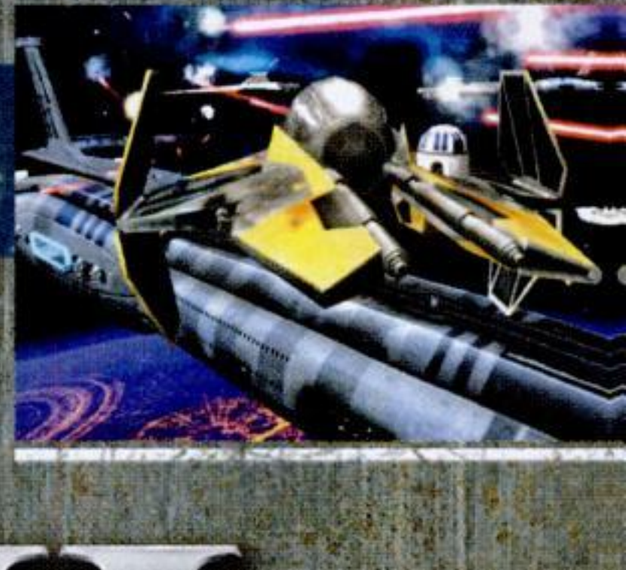

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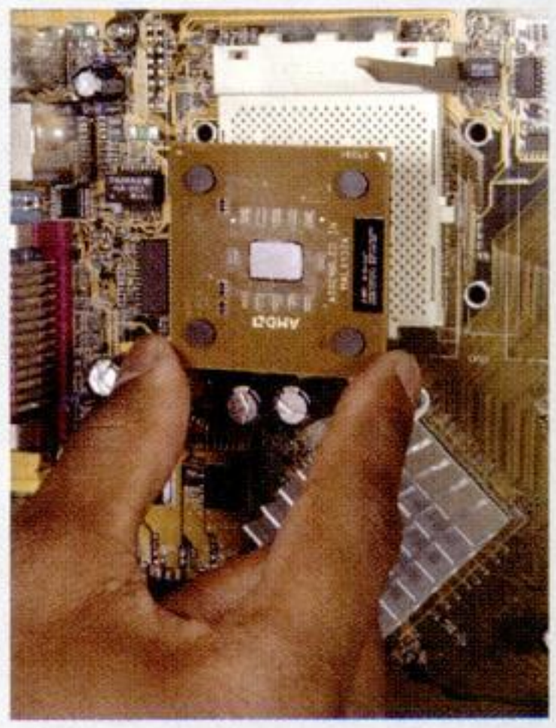
Upgrade Your CPU Step-by-Step

The first step in any CPU upgrade is to choose the right processor for your motherboard. The safest way to do this is to visit your mobo maker's website and look for a list of CPUs the manufacturer has certified. If you're feeling frisky, you can cruise the Internet to see if people are running CPUs beyond what the mobo maker has tested, but we don't recommend this tack for newbies. The second step is to update your motherboard BIOS; if you don't, there's a chance your machine won't boot with the new processor. Only then are you ready to begin.

1 Remove the old CPU heatsink by first prying off the heatsink retention module. This will vary from one heatsink to another, so you might want to consult the manufacturer's web site before you dismantle your PC. Once you've released the heatsink, carefully twist it left and right until the thermal paste works loose. If the heatsink is really stuck, fire up the machine and run a CPU-intensive application to heat up the processor. The heat will soften the paste, and then you can shut it down and attack it again.

2 Now that the old heatsink is off, simply flip up the arm that locks the CPU in place, remove the old CPU, and put it in the CPU cookie jar. If you'd like to use it in another machine, place it on a clean, static-free surface. Once you've installed the new CPU, put the old one in that packaging until you need it again.

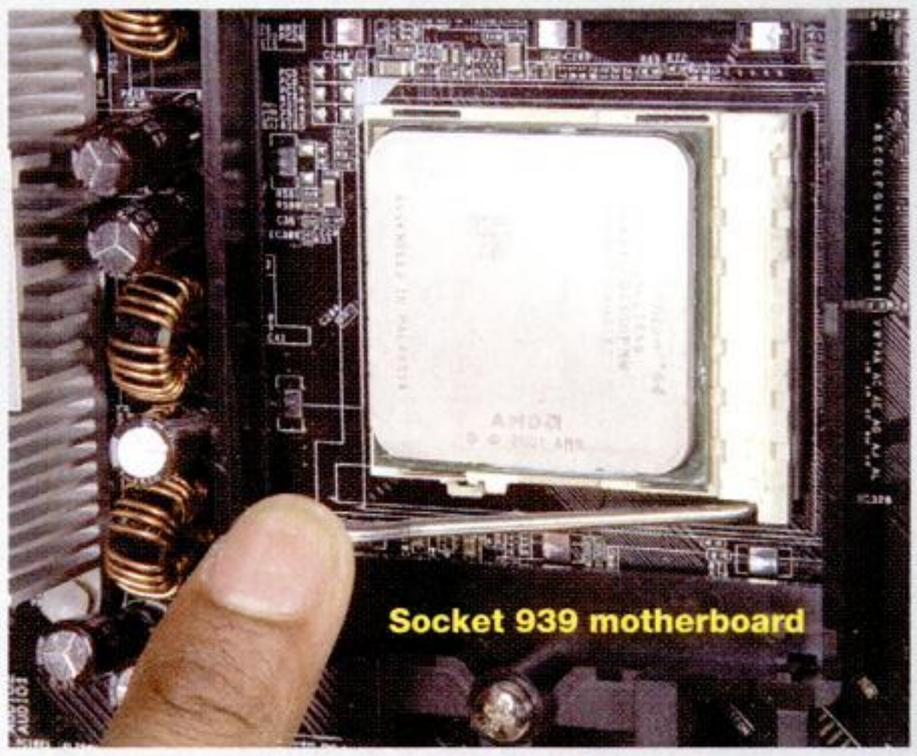


Socket 478, 754, and 939 Processors

3A Examine the notches on your new CPU to make sure it's properly aligned with the socket. Socket 478 Intel chips and Socket 754/939 AMD chips have an arrow that should match up with the arrow on the CPU socket. Carefully insert the chip into the open socket. There should be very slight resistance going in; anything more means you either have a bent pin on the new CPU or you have it lined up wrong. If you suspect something's gone awry, stand down *immediately* and take a look!

LGA775 Processors

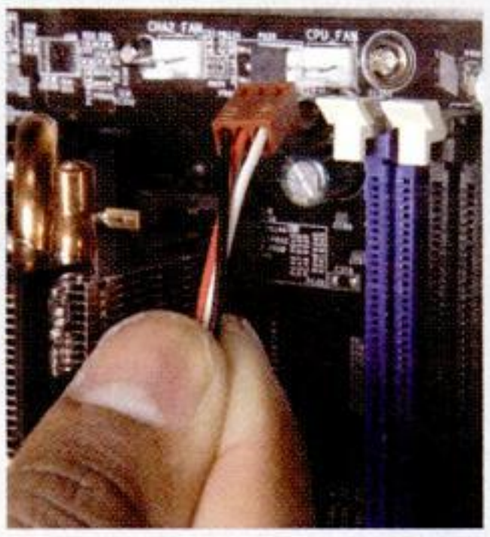
3B To install an LGA775 proc, hold the CPU with your thumb and forefinger directly over the socket. Lower the CPU straight onto the socket. Don't drop one side and then the other, and don't slide the CPU over the top of the socket. Either of these actions has the potential to kill the motherboard. Push the locking bracket down to secure the CPU in place.



Socket 939 motherboard

4 If you're using your old heatsink (you made sure it's capable of cooling your newer, hotter CPU, right?), you need to clean off all the old thermal paste using a lint-free cloth soaked in isopropyl rubbing alcohol. We recommend the 99 percent stuff you get at the pharmacy, but we've never had problems with the 70 percent grocery-store variety, either. Now, place a BB-size dab of thermal paste in the center of the mounted CPU. When you lock down the heatsink, the pressure should spread the thermal paste over the entire surface of the CPU.

5 Reattach the bracket for the heatsink, plug in the fan, and fire up that bad boy!



6 The last step in this installation is to verify that your CPU is running at the correct speed. Enter the BIOS settings screen by holding down the F2 or the DEL key during boot. When you're in, check the values for the CPU multiplier and front-side bus speed.

For photography purposes, several different motherboards were used. We strongly discourage any attempt to use a Socket 939 CPU in a Socket A mobo.

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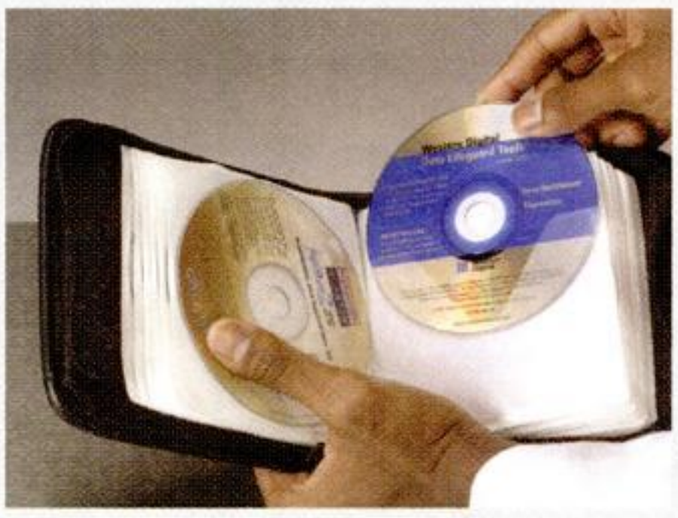
Upgrade Your Hard Drive Step-by-Step

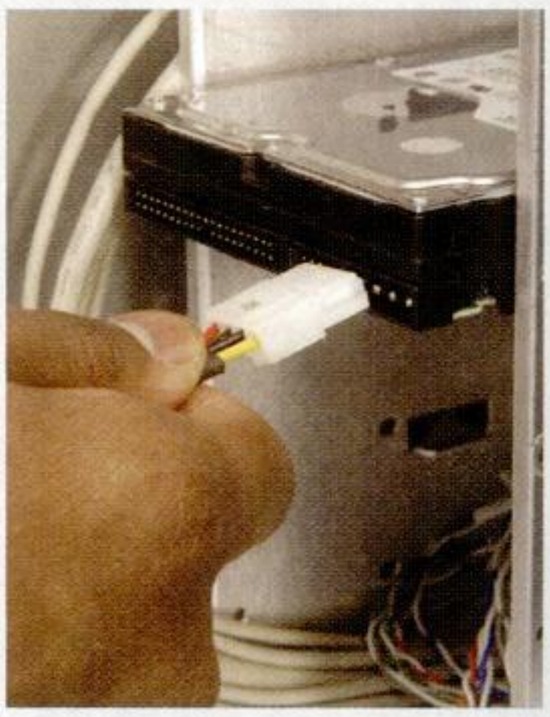
The golden rule for buying a new hard drive is to buy as much capacity as you can afford—no one ever complains about having too much storage. Today's highest-capacity desktop drives offer 500GB but are painfully expensive at about $1 per gigabyte. Our advice is to put your cash toward a drive in the 300- to 400GB "sweet spot." These drives cost between $150 and $250, which is a mouth-watering bargain considering their prodigious size and lightning-fast performance.

If your motherboard gives you the choice of using Serial ATA or Parallel ATA, we heartily recommend going with the former. SATA drives are much easier to install; besides, PATA will go away eventually. Once you've installed your new drive, you'll need to reinstall Windows and all your apps, settings, files, and media. Take a "clean slate" approach to ensure your new, pristine hard drive has a new, pristine copy of Windows on it, rather than a copied-over-and-funked-up Windows image from your old drive.

1 Before you begin, gather all the necessary files you'll need to get a brand-new installation of Windows up and running. This includes your Windows CD, chipset drivers, network drivers, video drivers, and your XP Service Pack 2 disc (if SP2 isn't already built into the copy of Windows you have). If you don't have an SP2 disc, you can download the update from Microsoft's web site. Don't worry about backing up the data on your existing hard drive at this point.

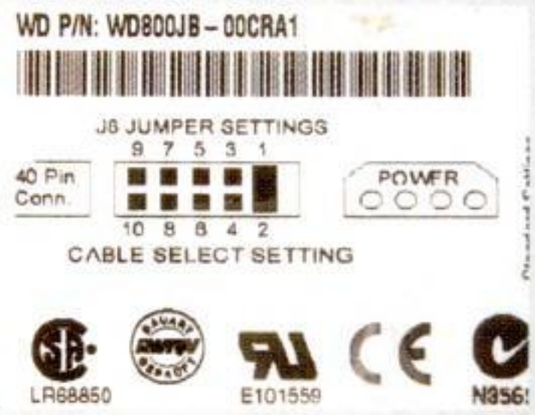


2 Most people leave their old drives inside their PC after installing a new drive. To guard against accidentally installing Windows over your old data, instead of onto the new drive, unplug the data and power cables from your old drive *right now.* You should also unplug any other drives, including backup drives and USB keys.

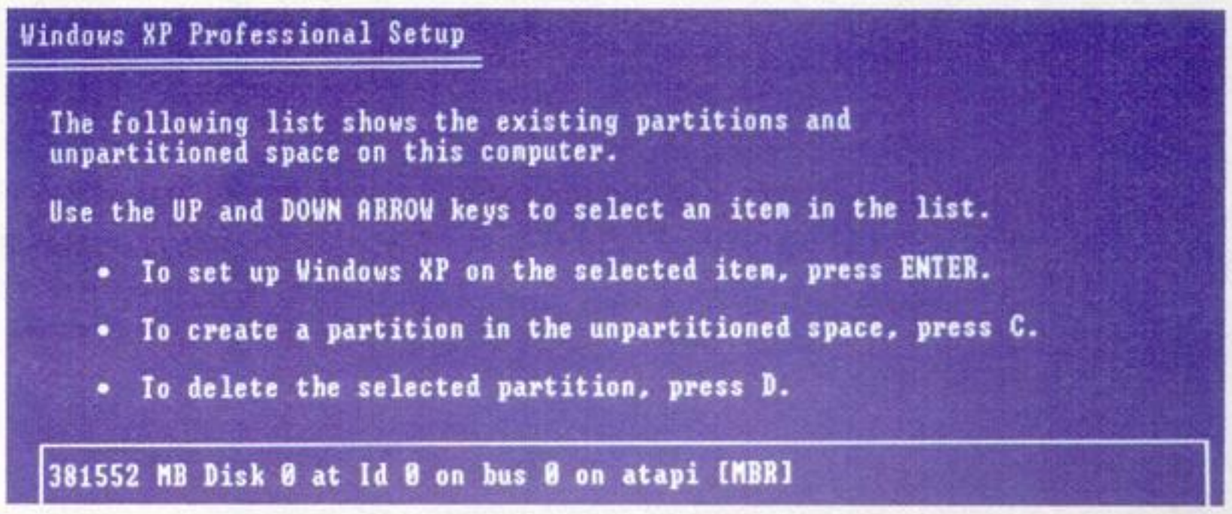


3 Insert the new drive into your case. If you're installing a Parallel ATA drive, skip to step 4. Plug in the SATA data cable and either the SATA power cable or the legacy four-pin power connector. If the drive has both power connectors, use one or the other—not both. Next, connect the SATA data cable to one of your motherboard's main SATA ports (check your mobo documentation) and skip to step 5.

4 Each Parallel ATA channel can handle either one or two devices in a master/slave relationship. You identify a hard drive as being either a master or slave by setting jumpers on the back of the drive; do this incorrectly, and the drive will remain invisible to the operating system. If your new drive will be the only one on the chain (the preferred option), configure it as the master. If it will share the channel with an existing drive that's been configured as the master, configure the new drive as a slave. Next, connect the Parallel ATA ribbon cable to the drive and to the motherboard, and then plug in the drive's power cable.



5 Now that your new drive is connected, it's time to install Windows. If you're sure your mobo BIOS is set up to boot from your optical drive, drop in the Windows CD, and boot 'er up. You'll eventually land at a screen asking which drive you want to install Windows on. Because you had previously disconnected your other drives, the new drive should be your only option. Press Enter to get started, and prepare to savor that minty-fresh-OS feeling!



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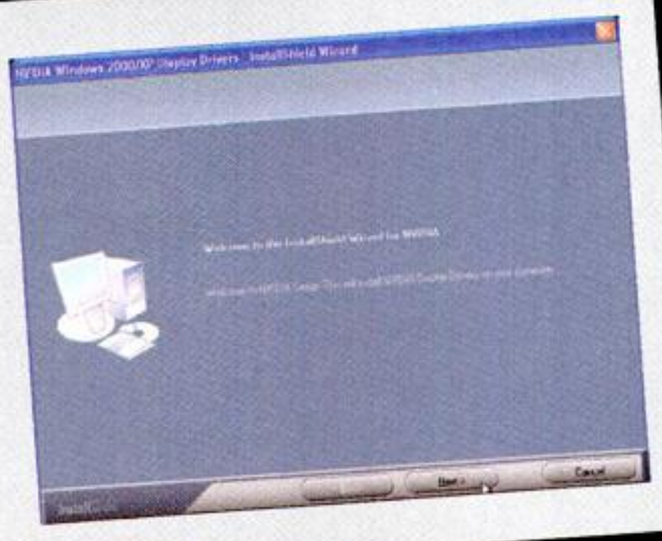
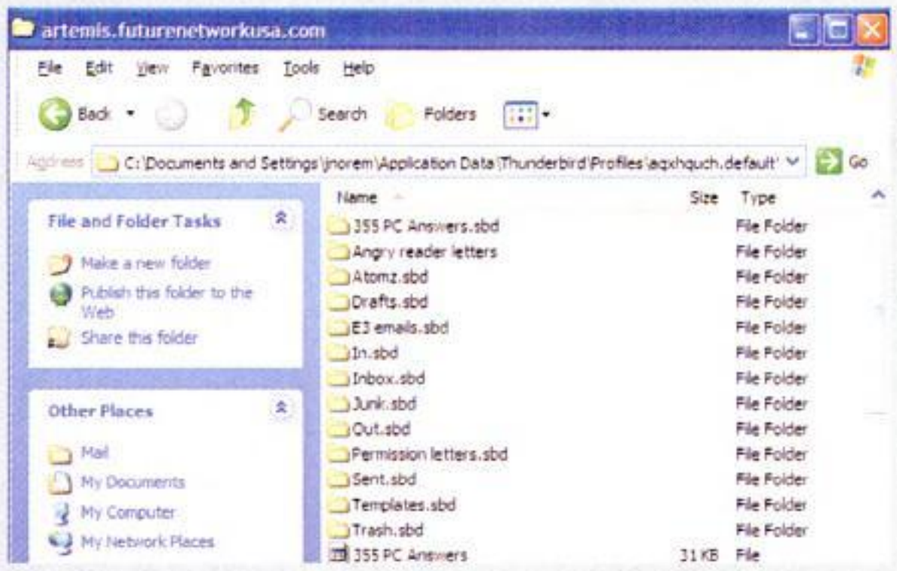
6 Once Windows is installed, the next step is to install all the necessary drivers and files. Start with Service Pack 2 (if it's not already included in your Windows installation), and then move on to your chipset, videocard, network, and any other drivers you might need.

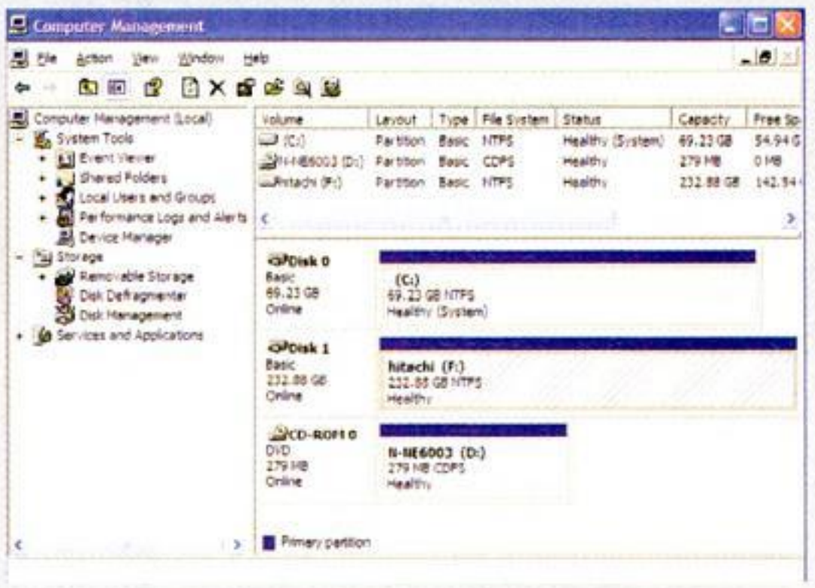


7 At this point, you should have a fully functioning Windows installation with all your drivers installed, all devices functional, and all systems go. Now comes the time to reinstall all your applications, including your games, image-editing software, media-burning apps, email client, and so on.

8 You can easily copy the contents of your My Documents and other personal folders, but you might have to hunt down your email files. Open an Explorer window, click the Tools menu, choose Folder Options, and then click the View tab. Look in the Advanced Settings window and click Show Hidden Files and Folders. Open your email client's Help file and determine where the program stores your email (it's usually in a subfolder of C:\Documents and Settings\<your username>\Application Data).



9 Once you've removed everything you want from your old drive, open Windows' Control Panel and click Performance and Maintenance > Administrative Tools > Computer Management > Disk Management. (Note: If your Control Panel is configured for Classic View, go directly to Administrative Tools.) The horizontal bars you see here represent the drives connected to your PC. The drive identified as Drive 0 and labeled C: will be your main drive (when you reconnect it, your old drive will likely be identified as Disk 1 and labeled D: or E:). To format your old drive—again, make sure you've copied everything you want from it—right-click the volume, select Format and follow the prompts to format the drive. Once it's finished, you can use your old drive as a backup drive or as supplementary storage.



Upgrade Your Power Supply Step-by-Step

PC components in general—and videocards in particular—are becoming increasingly hungry for electrical power. Upgrading your power supply might not seem very sexy, but it could mean the difference between your PC being a steady performer or an unreliable beast. This is also one of the easiest upgrades to pull off, so don't let us catch you whining!

1 Once you've removed your existing power supply—making sure you've first unplugged all the associated cables from the motherboard, videocard, and drives—it's time to mount your new one. Slide the new PSU into its cage in the same way you pulled out the old one—specifics will depend on how your case is designed. Be sure all the power cables are clear of any obstructions, line up the threaded screw holes in the power supply with the holes drilled into your case, insert the screws, and tighten them down.

2 The next step is to plug the power supply's cables into your motherboard, drives, and—if needed—your videocard. Assuming you have an ATX motherboard, you'll insert one 24-pin plug (rectangular in shape) and one four-pin plug (square in shape). SLI configurations may also require a D-shaped Molex four-pin plug as well as special PCI Express videocard power connectors. These plugs are designed to fit only one way. Apply firm, steady pressure, but don't force the plug or push so hard that you flex your motherboard.

Your drives require dedicated power cables—don't use Y cables. Each optical drive requires a D-shaped four-pin plug, and each SATA hard disk requires a flat 15-pin connector (older hard drives use the same D-shaped connectors as optical drives). Floppy drives and media-card readers use smaller connectors. Once you've supplied all your devices with power, plug in all the cooling fans inside the case. Use cable ties to tidy up when you're finished.

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Upgrade Your Videocard Step-by-Step

If your videocard is more than six months old, you can kiss chunky frame rates goodbye by upgrading to a new card. The same goes for PCs of any age that are outfitted with integrated graphics. And if you're lucky enough to have an SLI-capable motherboard, adding a second, matching nVidia videocard will nearly double your PC's performance with many games—*woo hoo!*

When you're selecting a videocard, it's important to know whether you have a newer PCI Express motherboard, or an AGP motherboard. The easiest way to tell is to open the case and look inside. If you see several extremely short (about 1.5-inch) slots, you have a PCI Express board. If you don't see those slots, or see only one, odds are you have an AGP board. An AGP videocard won't fit in a PCI Express slot and vice versa, so know what you have before you go shopping.

Before installing your new card, visit either ATI's or nVidia's website and download their latest device drivers (Catalyst or Forceware, respectively). You'll install these after you install your new card. It's equally important that you uninstall your old device drivers *before* you swap out your videocard. ATI provides a free utility for this purpose, but you can also use the Windows Control Panel to remove either ATI or nVidia drivers. If you're using Windows XP, make sure you're logged on with Administrator rights, and then open the Windows Control Panel and choose Add or Remove Programs. Locate the relevant driver and click the Change/Remove button. Shut down your PC when you're finished.

1 Unless you're installing a second card for SLI, you'll need to remove your existing videocard. Disconnect the power cable from the power supply (a software shut-down isn't sufficient). Open your case and discharge any built-up static electricity by touching the chassis. Disconnect the monitor cable, and then remove the retaining screw from the mounting bracket. Push down on the retaining clip at the far end of the PCI Express or AGP slot to release the card, grasp it near the mounting bracket (avoid touching any components or the SLI connector on the top of an nVidia card), and gently pull the card up and out of the slot. You might need to rock the card forward and back—not side to side—to release it.

2 Touch your case chassis again before removing your new videocard from its packaging. Holding the card by its top edge, align the card's edge connector with the expansion slot and push it into place. Examine the connection to make sure the card is in the slot, and then push the board down into the slot. Expect some resistance, but don't force the card. If it's aligned properly, it should seat itself fairly easily. Replace the retaining screw, making sure the card doesn't twist in the slot as you tighten it. Attach the monitor cable and the supplemental power cable, if your new card has one.

3 Flip the switch on the power supply and turn on the PC. When Windows has finished launching, locate the new device driver you downloaded at the beginning of this process, double-click the file, and follow the installation instructions. Reboot your PC when the installation is complete. When your PC has finished booting, right-click an empty spot on your Desktop, choose Properties, and then click the Settings tab to configure your desktop resolution. If you're using a CRT, click the Advanced button and then the Monitor tab. Crank up the refresh rate up to at least 72Hz to eliminate headache-inducing flicker.

Upgrade to SLI Step-by-Step

If you're installing a second, matching videocard (one that's based on the same GPU and—until nVidia changes things with its driver release 80—from the same manufacturer) to your SLI-compatible motherboard, the first step is to check the SLI settings in your motherboard's BIOS. These will vary by motherboard, but yours should be obvious enough to figure out.

1 Most motherboards must also be *physically* reconfigured for SLI, and there are a variety of ways to do this. Some motherboards, like the Asus A8N-SLI Deluxe, have you re-orient a paddle-like circuit board. Other mobos use jumper blocks, and still others accomplish the task entirely in software.

2 The next step is to plug in your second graphics card. If your cards require dedicated power-supply connections, it's critical that you use a separate power cable for each card—don't use a Y cable.

3 Now, connect the two videocards using the SLI bridge connector that came with your motherboard. After you've downloaded and installed nVidia's latest Forceware drivers, open your Display Properties window, click the Advanced tab, and then the nVidia tab. Click the SLI multi-GPU tab in the pop-out menu and place a checkmark next to the item that reads "Enable SLI multi-GPU."

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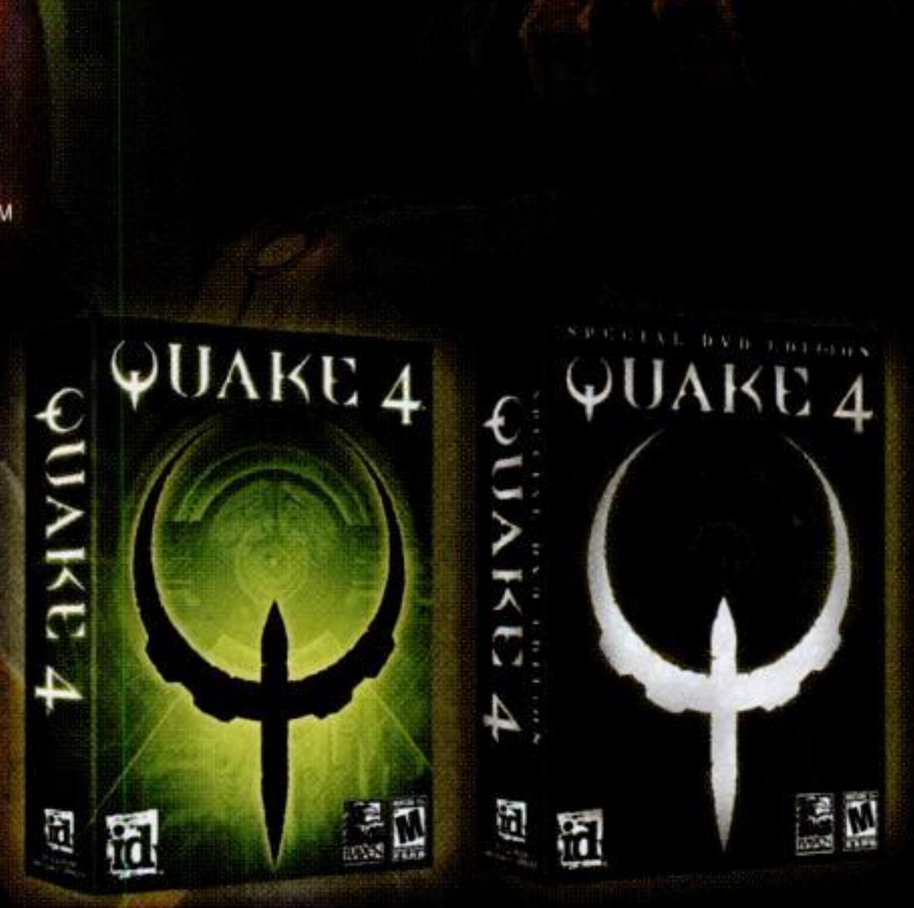

...THE INVASION BEGINS HOLIDAY 2005

A Game By id idsoftware.com

Developed By RAVEN

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Blood and Gore
Intense Violence
Strong Language

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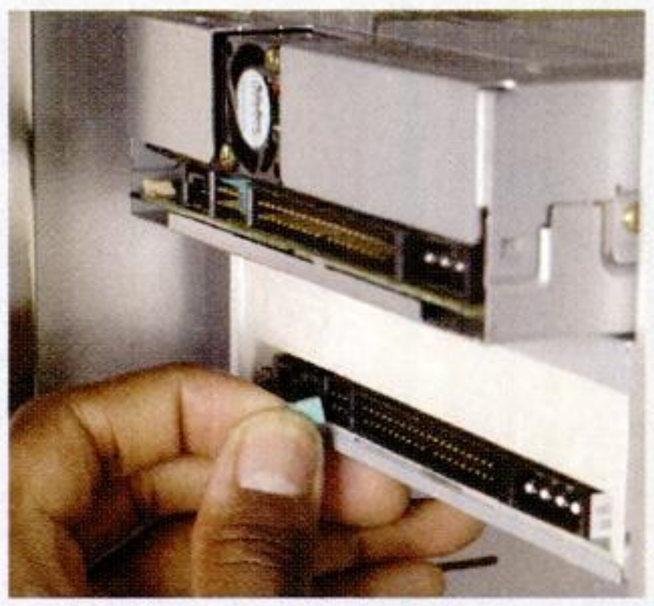
Upgrade Your Optical Drive Step-by-Step

Whether you're sticking with traditional Parallel ATA drives or moving to an all-SATA configuration, installing a new optical drive is just like installing a new hard drive—only easier! But that doesn't mean you can be careless, or that you should whiz through the process; for example, you'll want to screw the drive firmly into *both sides* of the case using all four screws. This will significantly reduce the amount of rattle and hum that high-speed optical drives generate.

1 You'll recall that each Parallel ATA device must be configured as either the master or the slave; but in an ideal world, your optical drive will have a channel all to itself so it doesn't have to share bandwidth. We set up this drive as the master, using jumpers on the back of the device. You'll find a jumper diagram for your drive either in its documentation or on a label on the drive itself.

2 If your new Parallel ATA optical drive must share a channel with a hard drive or another optical drive, configure one device as master and the other as slave. Because some operating systems have difficulty booting from slave devices, your hard drive should be set up as master and your optical drive as slave. Now you can move on to installing the drive and connecting its data and power cables.



3 If your new optical drive is a Serial ATA model, you won't have to fool with all this master/slave nonsense: Just pop in the drive (remember to use all four screws and tighten them firmly). Now connect the SATA cable to the SATA port on your mobo or expansion card and plug in either the legacy four-pin power connector or the slimmer, extra-fancy SATA power cable—but not both, obviously.

DISASTER CONTROL The best way to deal with upgrading horrors is to prevent them

Although new hardware appears all the time, and new standards have their own installation routines and quirks, there remain a handful of simple upgrading maxims that apply to any upgrading scenario. We inherited these pearls of wisdom from our grandfathers and grandmothers, and now we pass them along to you.

ALWAYS ground yourself before touching any components inside your PC. Simply touch the metal on the side of your PC's case when it's off but still plugged in. Wearing an antistatic wrist strap is even better, but these aren't of much use if they're not attached to something that's grounded; plus, they itch.

ALWAYS read all the directions before you begin your upgrading project. Documentation is notoriously poor, so you might end up completing a step only to find that the directions warn you *after* the fact not to epoxy your hand to the case.

ALWAYS write down your components' model and serial numbers before installing them. You'll probably never need them if you do, but we can almost guarantee that you will need them if you don't.

NEVER close your case before the first boot. We know you're eager to get up and running, but your new rig will need a little shakedown time first. Before you close the case, make sure your upgraded rig is stable. You should also go through the Device Manager to make sure there aren't any yellow exclamation marks next to any components.

ALWAYS install your drivers in the correct order. This shouldn't be necessary, but it is. When performing a fresh install of Windows XP, start with the OS, move on to Service Pack 2 (if it wasn't slipstreamed with the OS install), drop in your mobo's chipset drivers, follow that with DirectX, and then your videocard drivers. Finally, hoof it to **www.windowsupdate.com** to download the latest critical updates.

NEVER reuse thermal paste. Wipe off the old stuff with 99 percent isopropyl alcohol and lay on a fresh supply. MPC

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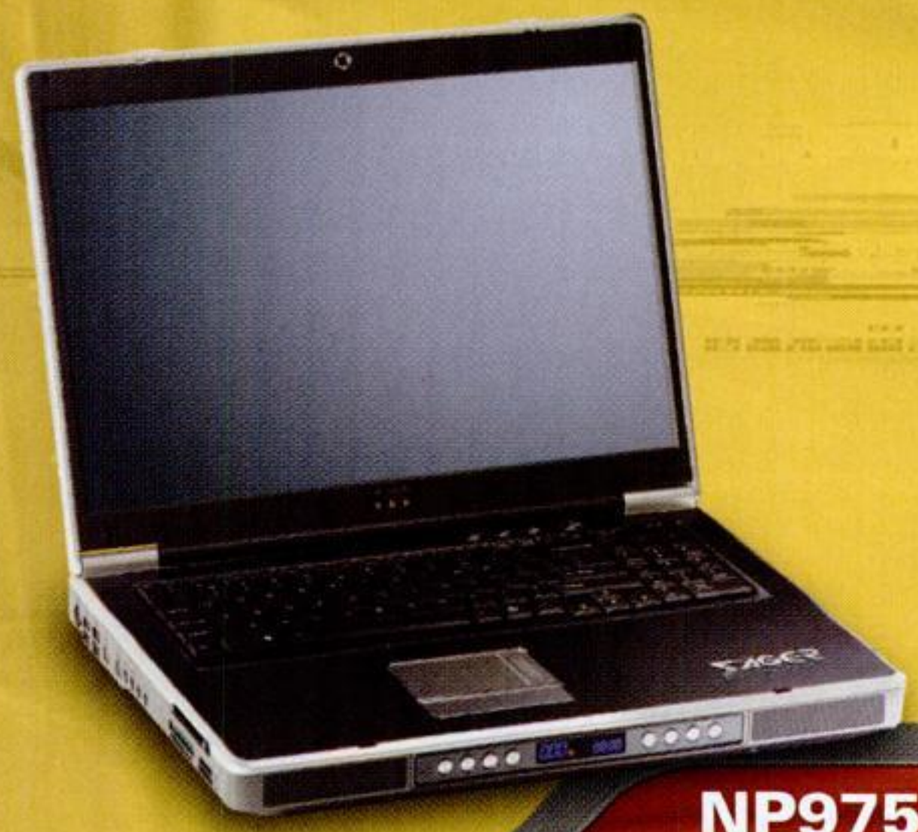

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The Great
CASE RACE

We pit six premium cases against each other in a battle to determine the caso supremo. With torture tests that get at the nitty-gritty of the building process, you can bet we know which of these beauties handle every bit as good as they look

Computers are expensive these days. Saving your dough for an Athlon FX was brutal, and paying for that pair of GeForce 7800 GTX cards left you with just one kidney and a nasty scar. Now that you have the parts of your dreams, don't blow your street cred at the eleventh hour by mounting them all inside a bland mid-tower case. *Maximum PC* traveled to the ends of the geek world to obtain the six baddest, most feature-packed enclosures available, and then we gave them a thorough probing to reveal their individual strengths and weaknesses. We quickly discovered that when it comes to cases, beauty needs to be much more than skin deep.

Although these cases represent the pinnacle of ATX technology, we remain on the hunt for the Ultimate Dream Case. Check out the wish-list of features that we challenge case manufacturers to implement the *next* time we call for the best PC cases the industry has to offer.

BY JOSH NOREM

PHOTOGRAPHY BY SAMANTHA BERG

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ANTEC P180

Virtually silent, except for the sound of our cursing

Antec bills its top-of-the-line P180 desktop case as an "Advanced Super Mid-Tower." We love its drop-dead gorgeous exterior, but there's much less to admire inside.

INSTALLATION

Building inside the P180 takes a lot of planning and patience; we found the overall experience to be more frustrating than rewarding. The case is designed to be ultra-quiet, with separate chambers at the bottom for the PSU and hard drives, adjustable-speed fans throughout, and triple-layer side panels to quell system chatter. Thick silicone grommets are present on all hard drive mounts, and the PSU cage is rubber-mounted to reduce vibration transfer to the chassis. While the P180 is certainly quiet—quieter, in fact, than most cases we've tested—building a system in this case requires extensive and aggravating cable routing through the cramped compartmentalized interior.

GOODIES

The case ships with three 12cm fans, which provide plenty of cooling. Two fans exhaust hot air out the top and rear of the case, while the third sucks air into the lower chamber. There's a mount in front of the case for yet another 12cm intake fan, but Antec doesn't include a fan. You'll also find a silly plastic shroud over the GPU area; but here again, no fan is included. We found the whole shroud apparatus chintzy and difficult to deal with, so we removed it during testing.

ANTEC P180 **7**

$170, www.antec.com

ASPIRE X-NAVIGATOR

More than enough cooling, and plenty of coolness

The X-Navigator is an all-aluminum case with flyweight proportions and a decadent lighting scheme that's clearly designed to lure the LAN-party crowd. If you can tolerate several minor flaws and all that glowing neon, you'll find an otherwise excellent case.

INSTALLATION

Installation was problem-free, thanks to the case's large size and old-school design. The case is extremely light, even when it's full of hardware, so you can easily schlep it around a work area. There are seven internal 3.5-inch drive cages, all of which require mounting screws, and there are four 5.25-inch drives that use rails, which also must be screwed on.

GOODIES

Five case fans are included, each of which can be daisy-chained and controlled via a single knob on the front bezel. Each fan has a blue LED, and the included 500W PSU lights up, as well. In these days of SLI, though, we remain suspicious of generic power supplies. Two temperature probes display their readings via an LCD on the front bezel, but there's nothing in the package for affixing the probes to their target devices. The case comes with two additional front bezels—one gray, one black—that easily snap on and off. We love the Navigator for its light weight, and its oversize stature tickles our "maximum" fancy.

ASPIRE X-NAVIGATOR **8**

$160, www.aspireusa.net

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LIAN-LI PCV-1100

Beauty and brawn—this case has it all

This intimidating all-aluminum enclosure is attractive on the outside, and equally tantalizing on the inside.

INSTALLATION

The PCV-1100's internal layout is similar to that of the Antec P180, in that it has a separate chamber at the bottom of the case for hard drives and the PSU; unlike the P180, however, this case sports the newfangled "reverse ATX" design. Reverse ATX cases mount the motherboard upside down, and the case opens on the right side. The interior of this case isn't particularly spacious, but having the hard drives and PSU out of the way makes installation easier than it would be in a traditional mid-tower. Cable routing is required, but the intelligent placement of the routing holes make this easy to accomplish.

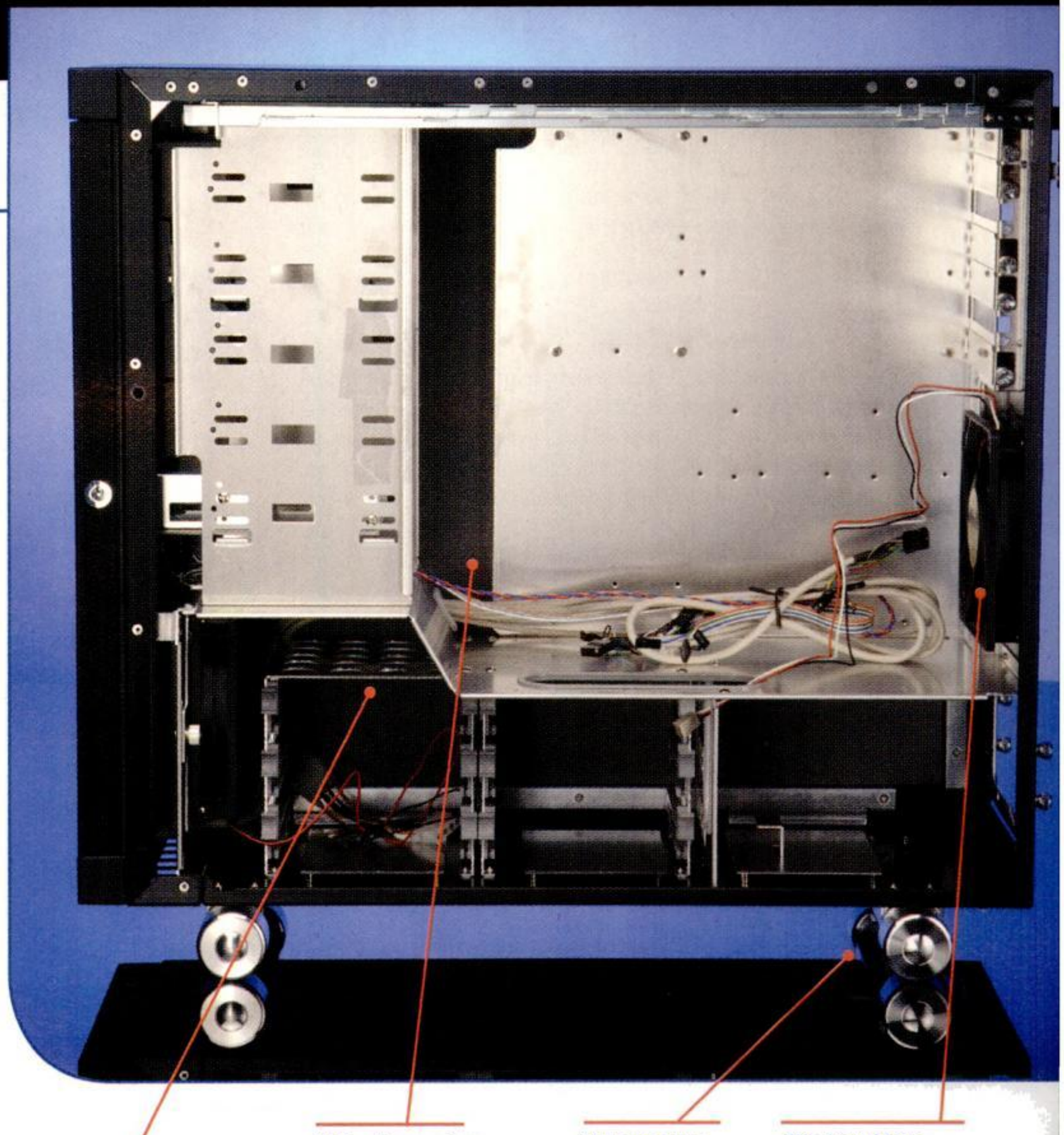
The hard drives use a slick rail-less mounting system that requires you to simply install a couple of screws in the sides of each drive; the screws then slide into channels in the drive cage and lock into place. The mounting scheme for PCI cards and optical drives, on the other hand, is more conventional.

GOODIES

Lian-Li bills this as a "silent" case, and it *is* very quiet. There's noise-dampening material on both side doors, and its 12cm intake and exhaust fans are hushed. Rubber on the edge of the front door further stifles noise from within, and included rubber treads can be applied to the case's wheels, for both better grip and to prevent noise transfer to a hard surface. Set the wheel brake and the case stays right where it is.

This case doesn't sport any shiny LEDs or other adornments that will keep you awake at night. We'd have preferred to have the USB and FireWire ports on top of the case, where access is easiest, but their front-mounted placement is acceptable. The screws that hold the side panels remain attached to the panels when unscrewed, which is a nice touch, and the panels themselves slide on and off with incredible ease. Although there's no tool tray, swing-out doors, or other fancy contraptions, the PCV-1100 covers all the bases.

Special thanks to SilverPCs.com for providing our test rig.



In this snazzy hard-drive mounting system, drives slide into rails which are then locked down by plastic tabs that take only a second to release.

Noise-dampening material installed on each of the side doors reduces noise output.

You can set a brake to keep your case from rolling away, in the event a rambunctious pet slams into your rig.

This Lian-Li provides more than ample cooling. The case includes two super-silent 12cm fans: one sucks air in and the other blows it out.

LIAN-LI PCV-1100

QUESADILLA

Great cooling, quiet, elegant, and easy to build.

CASE-A-DILLAS

No cutting-edge features.

9

MAXIMUM PC KICKASS

$210, www.lian-li.com

Dark, mysterious, and intimidating, we're calling Lian-Li's PCV-1100 "2001: A Case Odyssey."

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THERMALTAKE TAI CHI VB5000SNA

This case sports new features galore, but its price tag will terrify you

The Tai Chi is Thermaltake's most audacious case yet, with rows of extruded aluminum fins lining the case's sides. There are also swing-out doors, a set of carrying handles, and optional casters for rolling around the 40-pound behemoth. As exceptional as this case is, it falls just short of perfection.

INSTALLATION

Although it boasts a removable motherboard tray, the Tai Chi is so roomy you don't need it. We dig that the standoff holes on the motherboard back plate are labeled, so you know which ones to use based on your mobo's size and formfactor. Hard drives mount in a removable three-drive cage that includes its own 12cm intake fan. The cage can be screwed into any of the case's 10 5.25-inch drive bays. Unfortunately, if you want to use more than three hard drives, you'll have to buy either another cage or 5.25-to-3.5-inch adapters. We appreciate the ability to relocate the on/off switch to any of the front bays; USB, FireWire, and audio jacks, meanwhile, reside on top of the case—right where they belong, within easy reach. The slide-out tool tray in the bottom bay is very handy.

We found the PCI slots' tool-less retention mechanism to be much less cool. It forces you to push expansion cards down onto the motherboard, then slide them sideways into the mechanism, and then down into their slots. This is a pain in the ass and out of character for a case with so many other well-thought-out features.

You can buy a BTX backplate for the Tai Chi, but this might be a useless feature in light of Intel's recent move away from high clock speeds.

Thermaltake includes optional casters with the case—and you'll need 'em: This puppy weighs 40 pounds!

The Yin-Yang motif is achieved by two overlapping doors that protect the case's grill while still allowing ample airflow.

This swing-out door is made to hold a radiator/fan assembly that sucks air from inside the case and blows it through the radiator.

THERMALTAKE TAI CHI

FINS

Love the doors; very spacious, and ready for a water-cooling kit.

FANGS

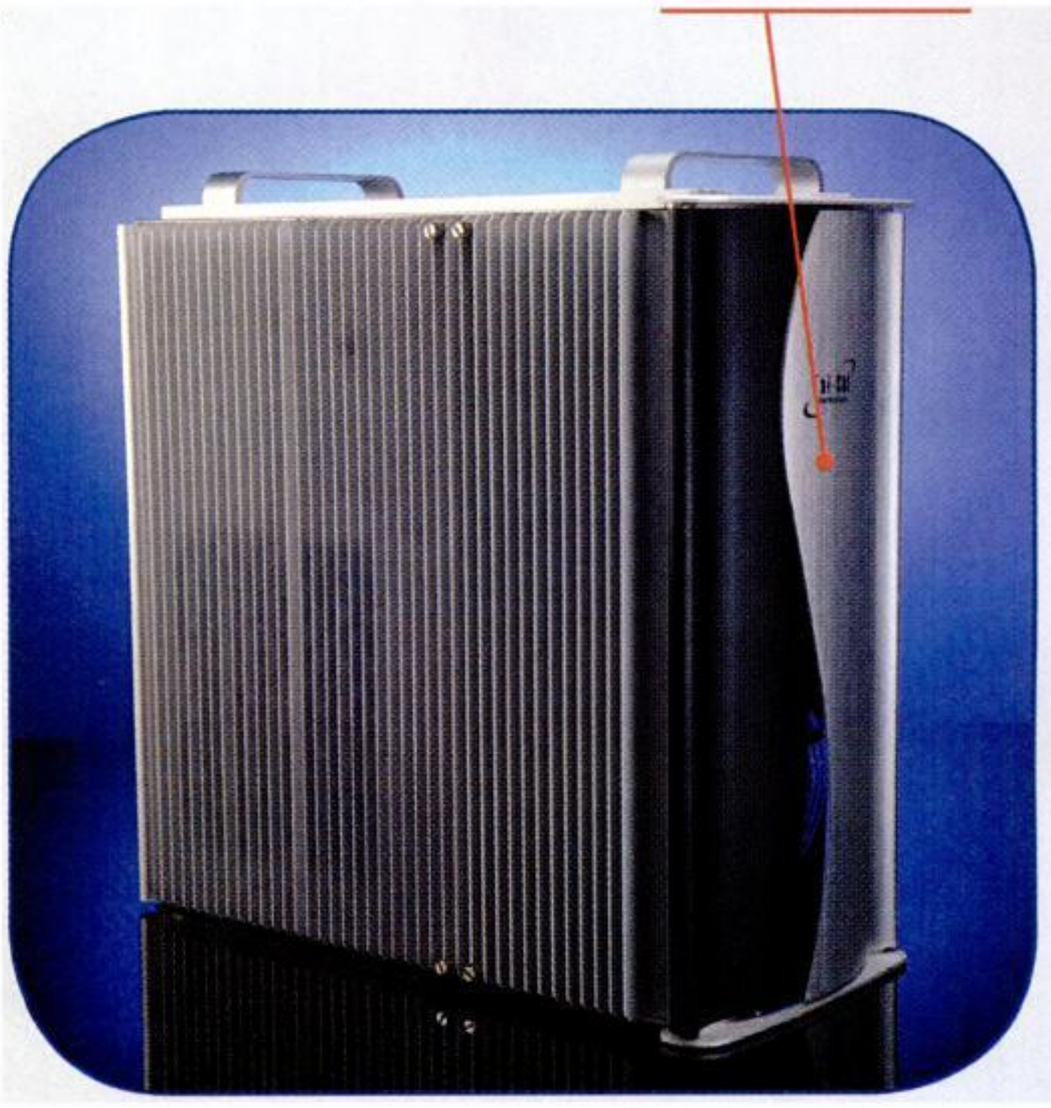
PCI-retention mechanism sucks; pricey.

9

$400, www.thermaltake.com

GOODIES

Water-cooling enthusiasts will love the water-cooling mounts integrated into the Tai Chi's door. The case is designed to be used with Thermaltake's Big Water kit (you can buy the case with the kit for an extra $100); but with a little modding, it should work with other kits that use dual 12cm radiators.



Thermaltake managed to make a hulking, 40-pound PC enclosure look graceful.

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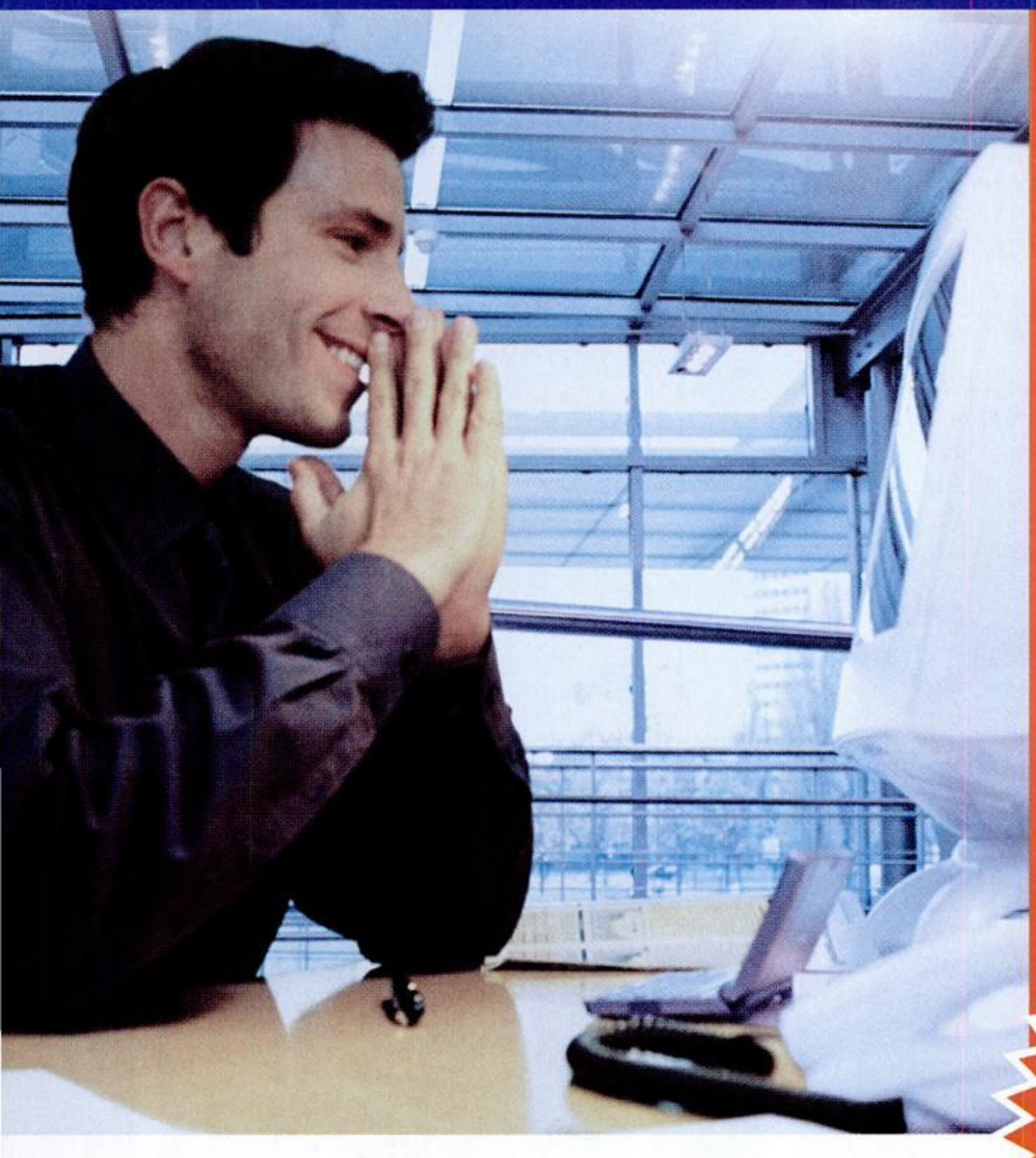

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ANTEC SONATA II

It sure is quiet, but still a little underwhelming

The Sonata II, Antec's follow-up to the original "quiet case," has changed only slightly—for the worse.

INSTALLATION

The Sonata II is a bit more cramped than most steel mid-towers we've seen. Drives use screw-on rails, rendering them easy to snap into and out of their cages. The side-facing hard drive cage is convenient, despite the fact that SATA and power cables must be stuffed into the case in order to close the side door. As with Antec's P180, the Sonata II includes a shroud you mount over the CPU area. We installed the shroud and case temperatures actually *rose* by 2 C at idle. The case performed better when we removed the shroud to promote airflow and free up space. The 450-watt power supply includes a 24-pin power connector and a PCI Express videocard plug, too.

GOODIES

What makes this case quiet is a lack of fans—there is only a single 12cm adjustable-speed Tri-Cool—and the presence of rubber grommets on the hard drive mounts. It's definitely whisperville when the fan is set to low. There's no intake fan, and the CPU/GPU shroud doesn't include any fans either, which is bunk. The Sonata is classy and low-key, but because of its minimal cooling and lousy shroud, the better-equipped cases in this roundup leave it in the dust.

ANTEC SONATA II **8**

$130, www.antec.com

The included SmartPower 450W PSU has cables for both ATX 2.0 and PCI Express.

The double-hinged door swings out 270 degrees—a feature all cases should have.

The front-mounted USB/FireWire ports are flanked by two super-bright blue LEDs, which seem out of place on such a quiet and otherwise classy case.

3R SYSTEMS R900

Plenty of space, but a bit rough around the edges

When we requested this case for review, the vendor told us it was too big for home use.

INSTALLATION

As with any full-size case, the R900's cavernous interior makes for simple installation. Still, we ran into a few roadblocks, the first being inadequate documentation: The case came with only a dinky leaflet explaining its power connectors. This wouldn't have been much of an obstacle, except that both of the included case fans have two-pin male connectors that plug into a fan bus, and we couldn't get either fan to work. It was impossible to diagnose the problem without any documentation.

Meanwhile, the side doors were mounted so tightly we thought they were welded shut—not good. After 10 minutes of work with a flathead screwdriver and a lot of elbow grease, we finally had them off.

GOODIES

This case isn't entirely tool-less, because screws are required to install everything, but it does come with a nifty toolbox full of thumbscrews for every possible scenario. 3R also includes a probe that measures the ambient temperature near the probe's mounting point and displays it on a front-panel LCD. Thermal tape isn't included, so you can't mount the probe near the CPU out of the box; it's best used to monitor internal case temps.

3R SYSTEMS R900 **5**

$125, www.3rsys.com

This case is so hardcore you can run dual power supplies. A two-into-one adapter lets you run both in serial.

This little knob theoretically controls the speed of both 12cm intake and exhaust fans, but we couldn't get it to work.

The R900 has two power buttons, so you can choose which one to connect and use. Sadly, neither button is labeled, so hooking up a single PSU is a trial-and-error affair.

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THE ENVELOPE PLEASE...

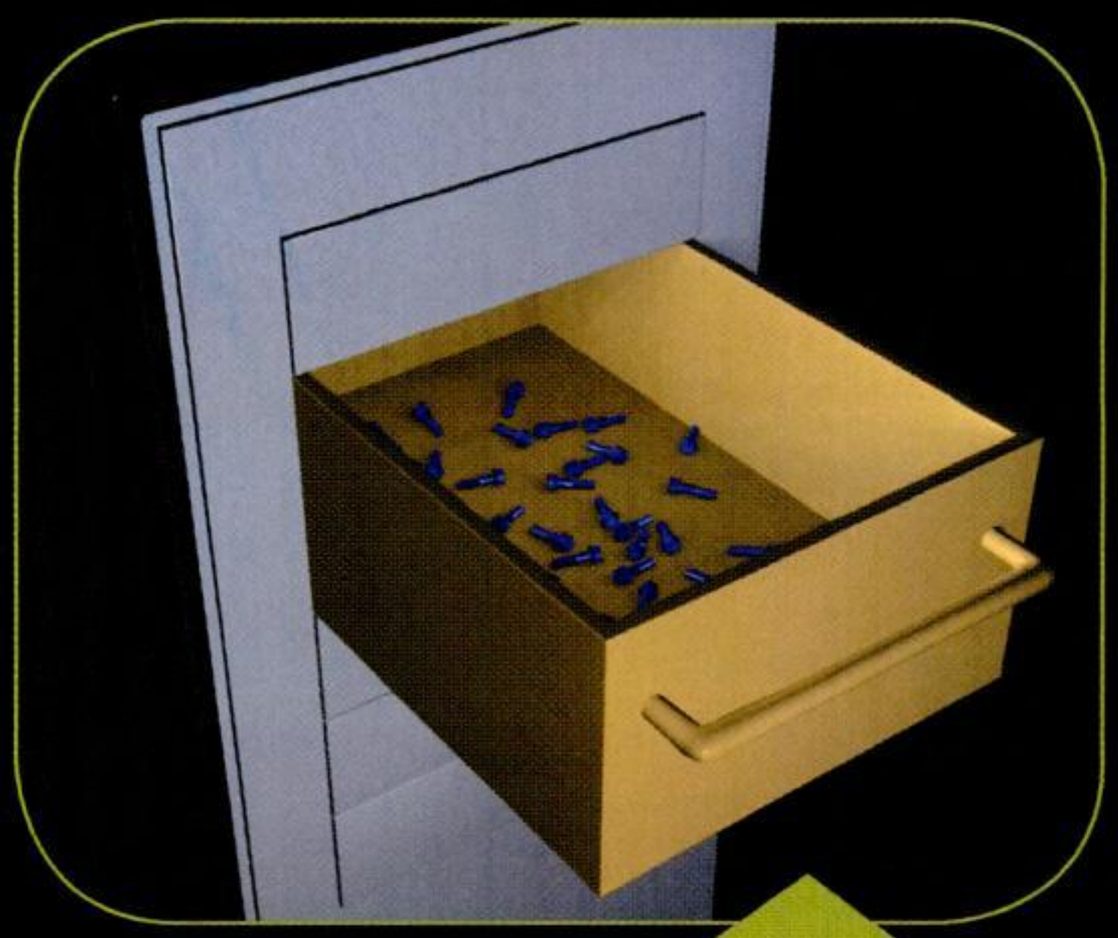
Though the verdicts in this particular roundup were rather low all-around, don't lose hope, dear reader. We are harsh critics, and have high expectations for any hardware that darkens the Lab's door. We're exceptionally finicky when it comes to cases. While we upgrade our systems fairly regularly, we rarely upgrade our case, so it has to be an enclosure that fits our current *and* future PC hardware needs. It also has to make building a system as easy as possible. As this roundup shows, you can't take that quality for granted, even in the realm of high-priced, full-tower enclosures.

Thankfully, there are some fantastic cases on the market today. Our favorite in this roundup is ***Lian-Li's PCV-1100***, hands down. Though we really liked the nifty doors and sweet design of Thermaltake's Tai Chi, its tool-less PCI-slot mechanism is difficult to use and annoying. The Antec P180 looked great on paper, sporting everything we look for in a case, but routing the cables was too much of a hassle. Lian-Li's PCV-1100 poses none of these problems. It's as easy to build in as it is elegant and quiet, and is well deserving of our Kick Ass Award. MPC

Lian-Li PCV-1100

BUILDING A DREAM CASE

We won't have the case of our dreams until we find one with all five of these features!

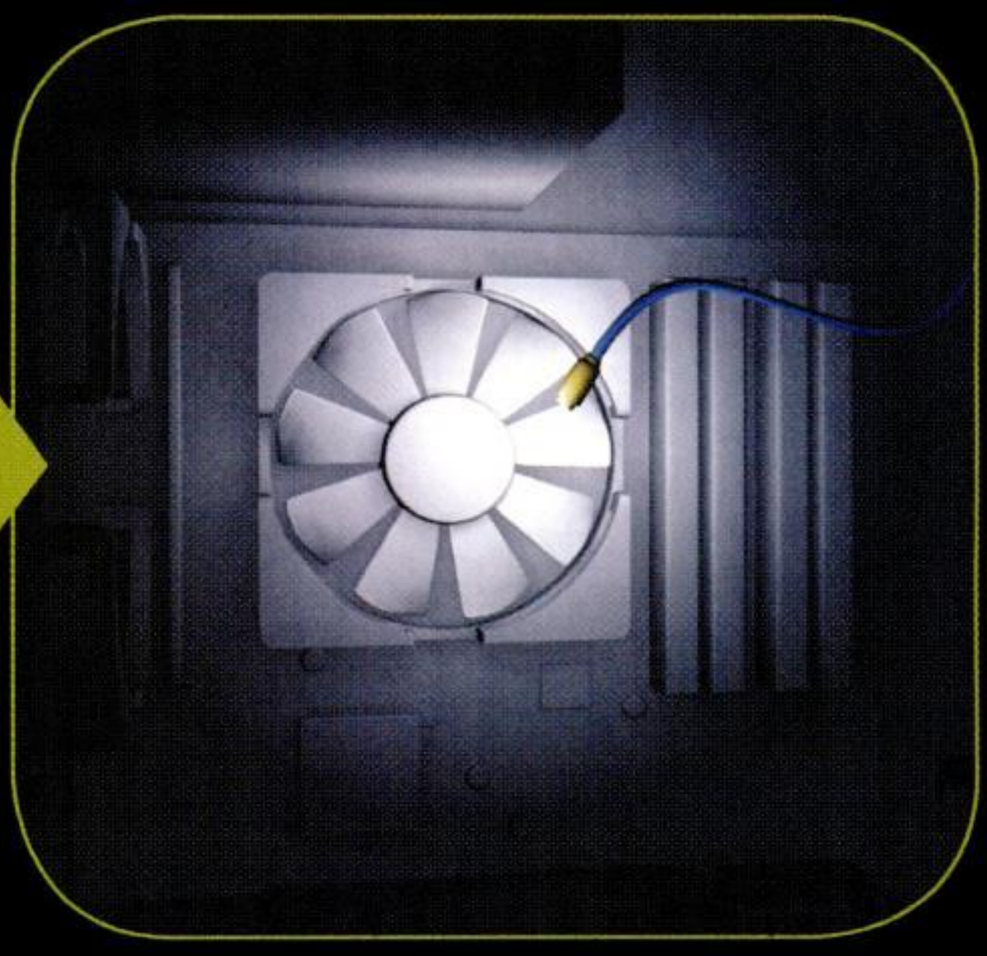


DRIVE-BAY TOOLBOX

A few Thermaltake cases sport a single-bay toolbox—which is great—but we want more; much more. Because we normally have three or four 5.25-inch bays free, why not use them all for tool and/or beverage storage? We could stash needle-nose pliers, a cold brewski, zip-tie cutters, screwdrivers, case screws, VGA adapters, and other commonly used doodads. Better yet—what if this slide-out toolkit came stocked with tools right from the factory? Whoa!

FLEXIBLE INTERIOR LIGHT

We're sick of clamping flashlights in our teeth to work on our PCs. We need—nay, demand—interior lighting. Ideally, our fantasy case would have a long, flexible snake light, with LEDs at the tip. When we need to see the orientation of a SATA port, we just flick on the battery-powered light, point it at the socket and *boom,* light!



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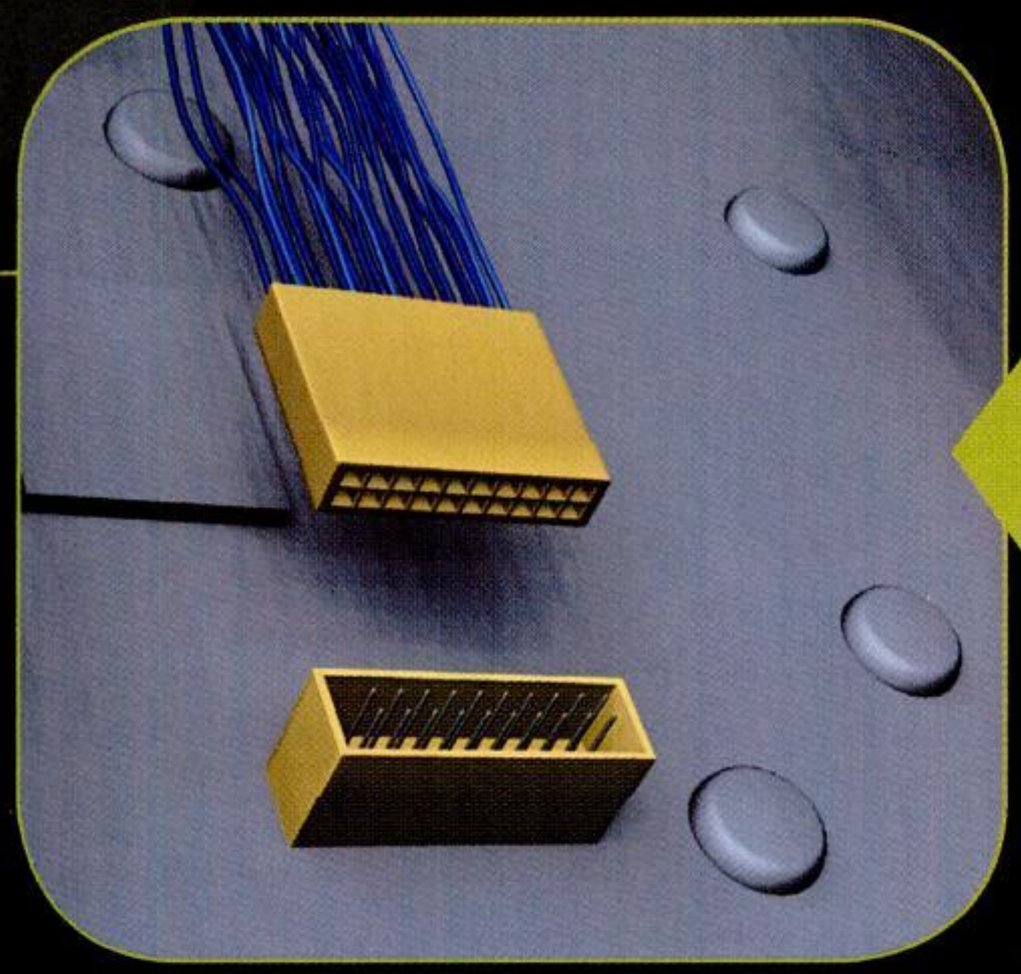
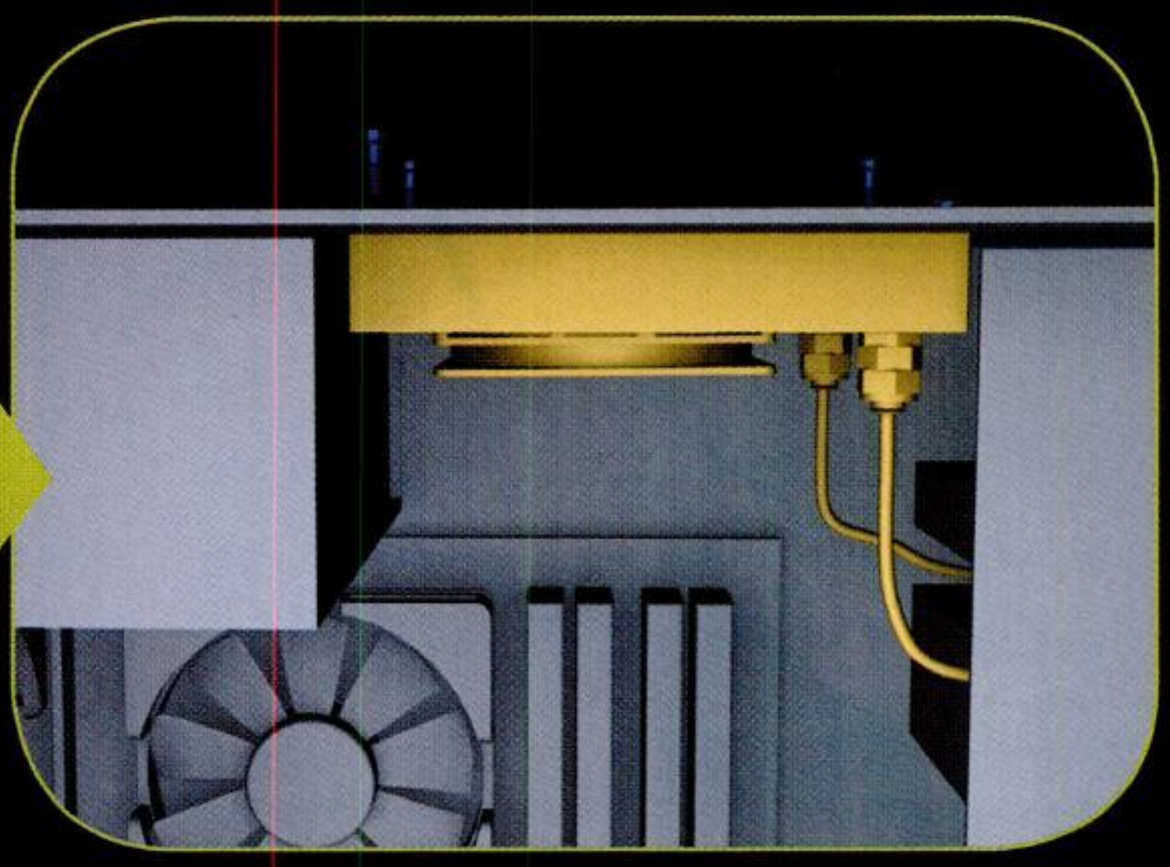


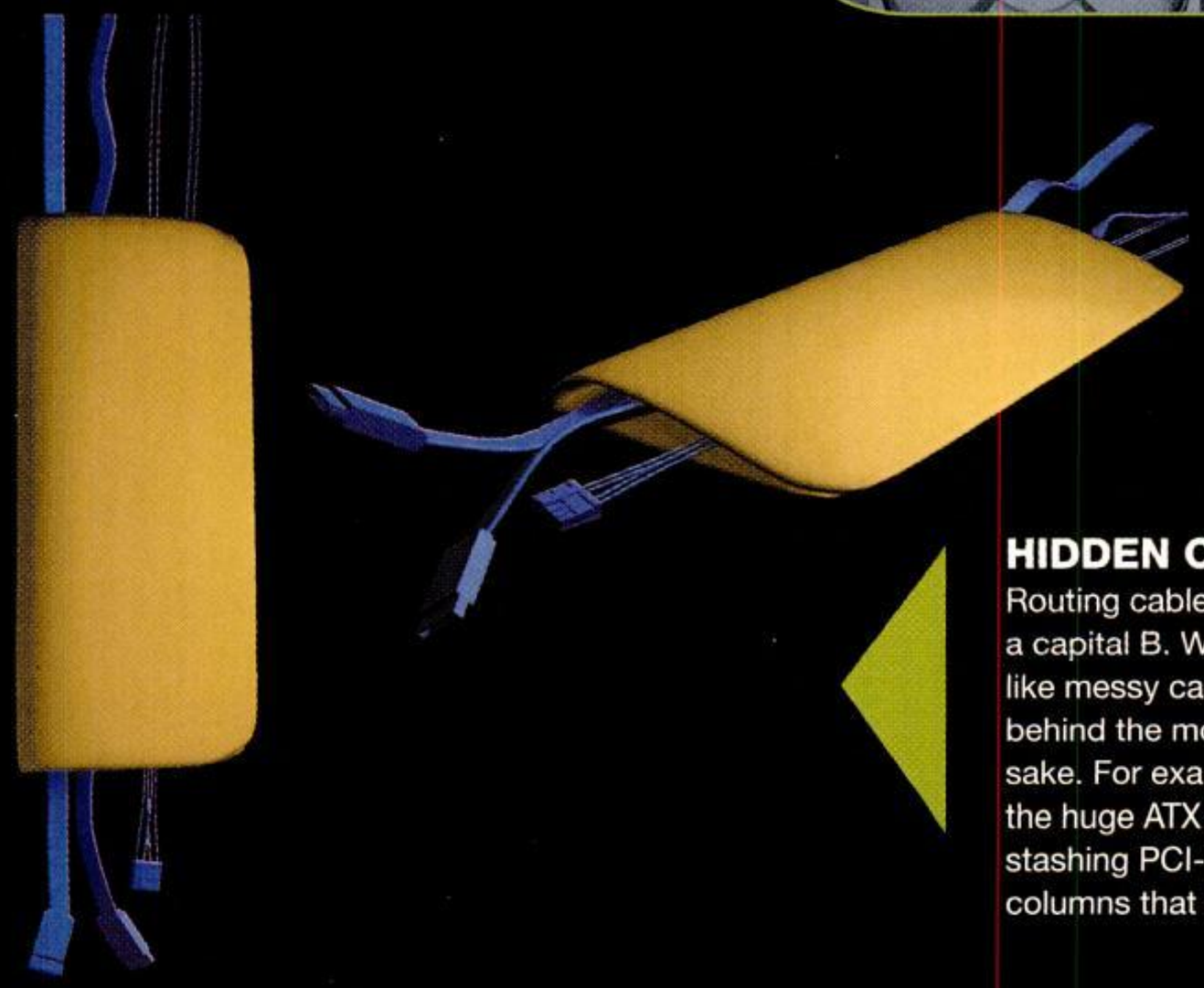
STANDARDIZED FRONT-PANEL CONNECTOR

Is there some reason—aside from the sadistic tendencies of manufacturers—that every PC mobo has a different design and location for its front-bezel I/O connectors? We shouldn't have to decode these little buggers on every single mobo, because they all do the same thing. Give us a single, unified connector that goes from the mobo to the case, so we can hook up the front-panel power, reset, and HDD LEDs in one simple step.

WATER-COOLING MOUNTS

We give big props to Thermaltake's Tai Chi case (page 42) for being "water-cooling ready" right out of the box. It's time other manufacturers stepped up to the plate. Every case should include a dedicated area for mounting a radiator—perhaps even dual 12cm radiators, in high-end cases—a separate chunk of real estate to place a pump, and pre-cut holes in the back of the case for routing tubing to an external radiator.





HIDDEN CABLE RUNS

Routing cables through today's cases is a bitch, with a capital B. We don't like routing cables, but we don't like messy cases, either, so let us stash them easily behind the mobo or within the support rails, for Pete's sake. For example, what could be easier than routing the huge ATX power connector under the mobo, or stashing PCI-E power cables in the vertical support columns that run down next to the videocard?

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›››

› **GRAPHICS CARD:**
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› **PROCESSOR:**
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› **MEMORY:**
1 GB Dual Channel DDR2 SDRAM at 667 MHz ‹

› **GRAPHICS CARD:**
NVIDIA® GeForce™ 7800 GTX PCI Express with 256 MB DDR3 ‹

› **ADD MORE POWER:**
SLI Dual NVIDIA® GeForce™ 7800 GTX PCI Express with 512 MB DDR3 [2 x 256 MB] ‹

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Gifts for Geeks

This holiday season, Maximum PC journeys to a winter wonderland in search of gift ideas for computer enthusiasts

It might seem like the stuff of fairy tales, but there actually exists a far-off arctic enclave filled with fun gear and gadgets for computer geeks. Bound together by their techcentric ways, these products have found fellowship, even romance, among their kind in the bosom of this snow-capped hamlet. But let's face it, deep down each item wants desperately to be plucked from this sub-zero haven and gifted to some deserving tech-head.

Sounds like the perfect place to find a holiday gift for the computer geek in your life, wouldn't you say? Let's have a look.

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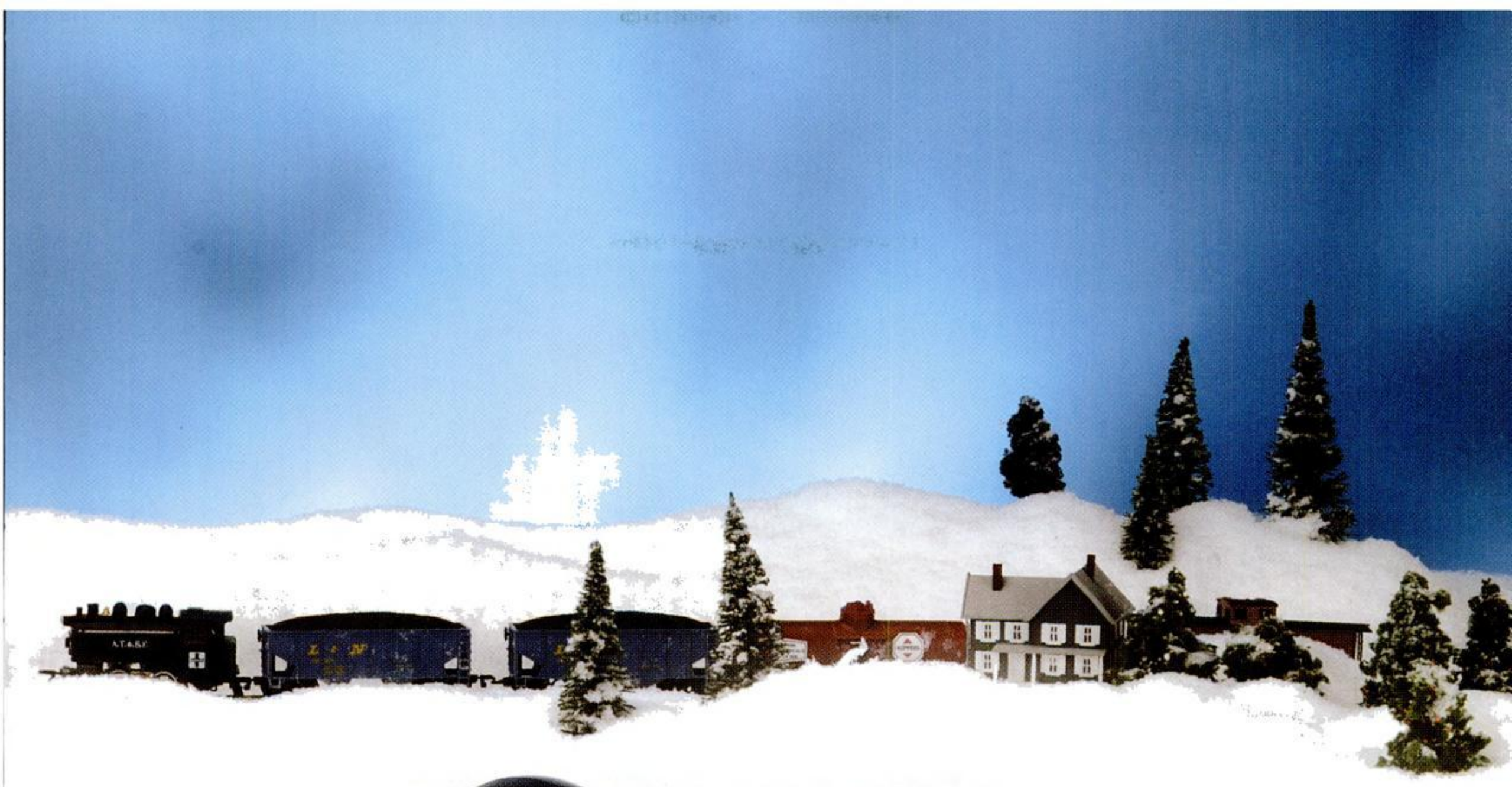


3-IN-1 IPOD MOUNT, TRANSMITTER, AND CHARGER

After multiple car break-ins an exasperated victim taped a piece of paper to his window that read, "No radio inside," only to find a note amid the shattered glass the next morn that said, "Get one." If only he'd had Sakar's 3-in-1, an adjustable mount for any iPod that charges your player through the cigarette-lighter jack while transmitting your music to your FM radio.
$50, www.compusa.com

SPORTSTER REPLAY RADIO

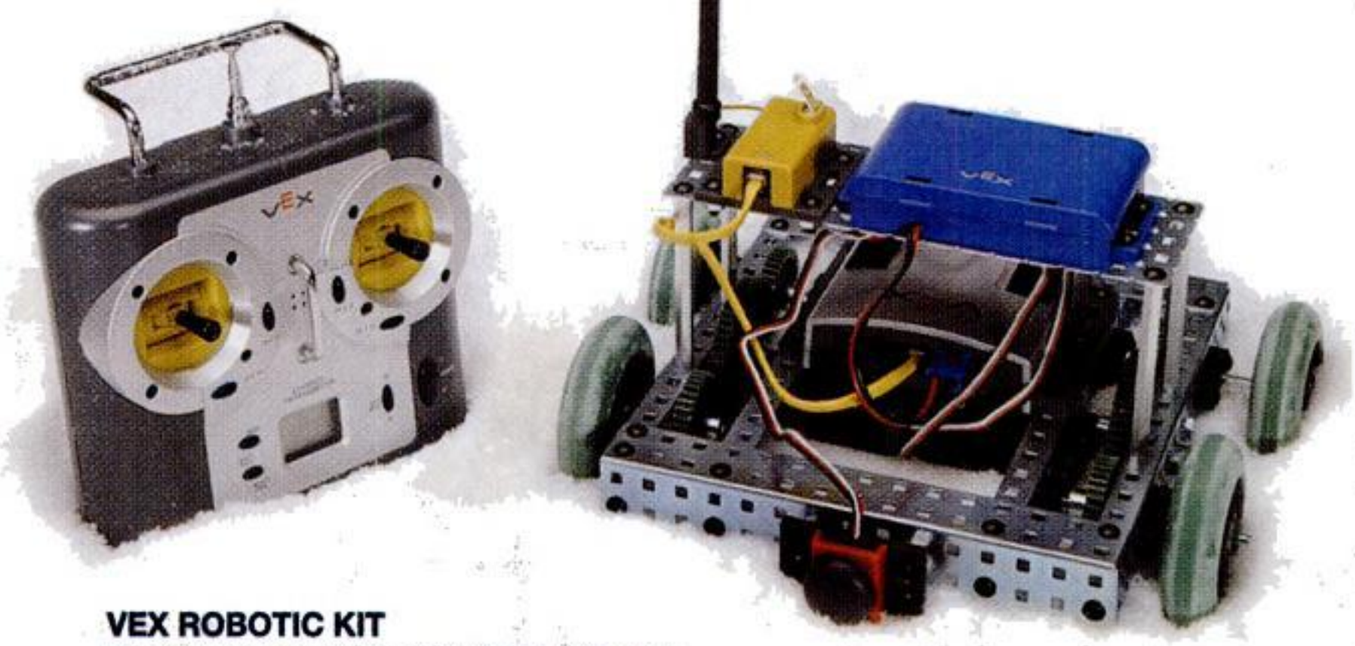
No single collection of MP3s can possibly match the diversity of Sirius Satellite Radio's massive library. And the best way to tune into dozens of channels of news and music is Sirius' Sportster Replay. Built-in memory lets you record 44 minutes of audio, so you can skip back through any broadcast or replay your favorite songs. Listen to it through your home- or car-audio system.
$270, plus $13 monthly subscription, www.sirius.com

DESKTOP MULTI-HUB

Sick and tired of reaching behind your PC to plug in your digital camera, USB thumbdrive, video camera, and other devices? Nyko's Desktop Multi-Hub puts everything in easy reach. In addition to four powered USB 2.0 hubs, the octagonal box has ports for audio in and out, FireWire, PS/2 devices, and S-video out.
$80, www.nyko.com

HARMONY 880 REMOTE

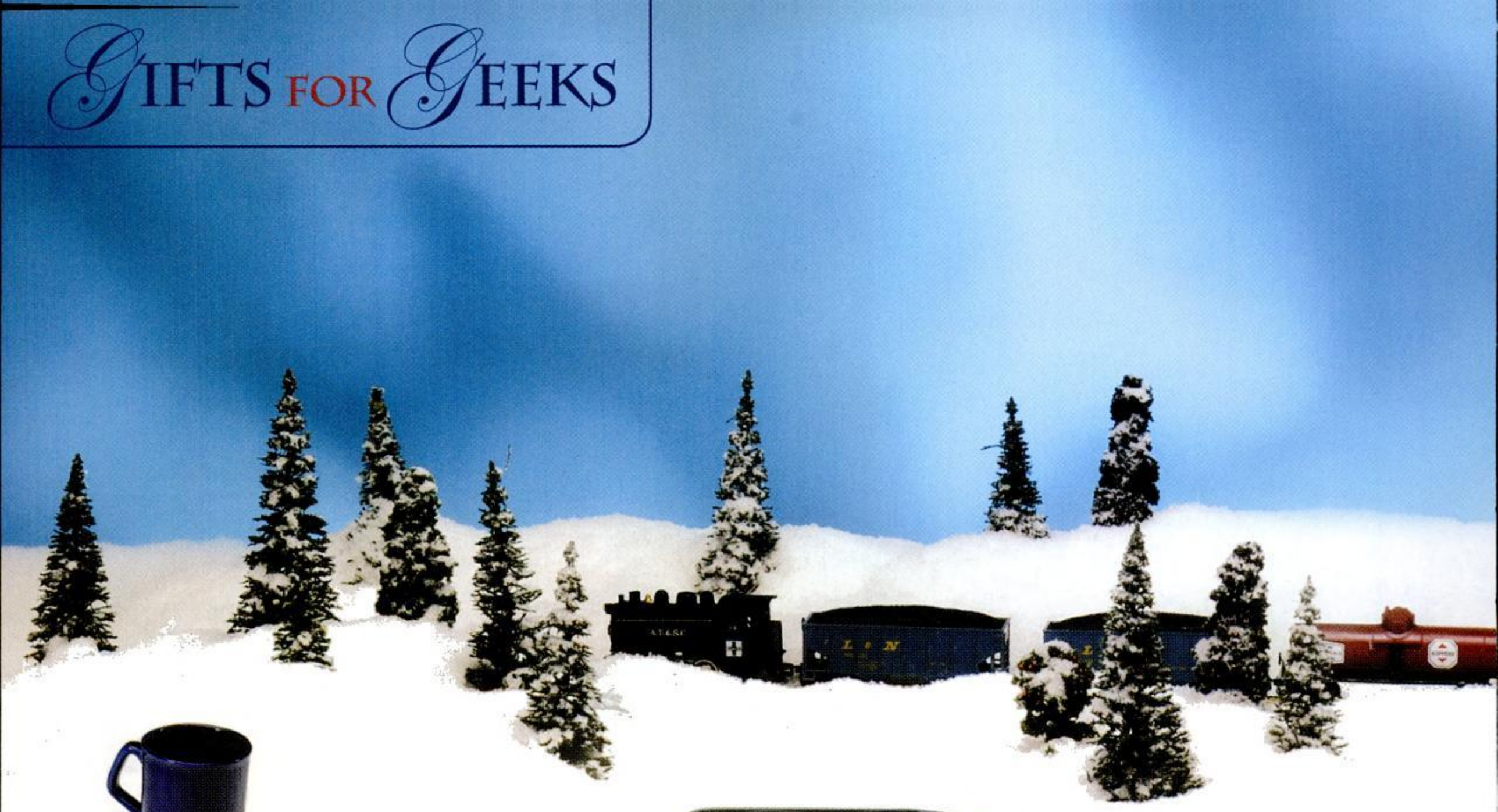
We've all suffered from the condition known as *toomanyremotesitis*. It's what happens when you leave your PC to peep *Battlestar* and are faced with a pile of remotes to operate your TV, PVR, and stereo. Luckily, there's a cure (and it doesn't involve penicillin)! Logitech's color-screened *ultra*-universal remote replaces all others, and its simple-to-use macros make it significant-other-approved, to boot!
$250, www.logitech.com/harmony



VEX ROBOTIC KIT

Admit it, you've wanted a robot buddy since you were a kid. Your time has come! The Vex kit includes all the transmitters, motors, wheels, whozits, whatzits, and flunklesnarkins you need to build your very own remote-controlled pal. Granted, it won't help you take over the world, but bring you a beverage, it will.
$300, www.vexrobotics.com

GIFTS FOR GEEKS



USB CAFE PAD

After the USB Lava Lamp and the USB Smokeless Ashtray, this USB-connected cup warmer doesn't seem so strange. In fact, it seems like a darned fine idea. The warmer keeps tea and coffee at a toasty-yet-comfortable temperature, can be used to melt Cadbury Eggs into dessert topping, and even converted into a mosquito torture chamber with an overturned shot glass.
$22, www.thinkgeek.com

WI-FI FINDER & USB ADAPTER

It scans for 802.11b/g/a hotspots, then reports their SSID and encryption status, among other details. Pop it into your USB port, and it becomes an 802.11b/g/a USB Wi-Fi adapter. And if you're feeling generous with someone else's broadband, it can even turn your laptop into an access point. Holy frijole, did Wi-Fi just become *sexy*?
$100, http://us.zyxel.com

PC TOOLKIT

When people think of tools, the staff of our sister magazine *PC Gamer* usually comes to mind. But there are other tools actually quite valuable to geeks, and hardcore geeks like us need hardcore toolkits like this one. The handsome black carrying case includes everything from a lost screw picker-upper, to a soldering iron, to a wire stripper.
$37, www.crazypc.com

20Q

All the accumulated knowledge of the human race has been digitized and condensed into a yoyo-size ball called the 20Q. Well at least enough info for this mysterious artifact to correctly answer "naked mole rat," "bazooka," and "slime mold" based on our "yes" or "no" answers to 20 questions each. And we used to think the Magic 8-Ball was cool.
$15, www.radicagames.com

FRETLIGHT GUITAR

Everything's made better with LEDs, including a guitar. Simply connect this axe to your PC and the 126 LEDs will display virtually every chord and scale, illuminating the path to geek-rock stardom. Your fingers have better places to be than in your ears, and the Fretlight shows you exactly where to put them.
$600, www.optekmusic.com

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CODESCOUT

If your car was manufactured after 1996, it's home to a tiny little troll who operates the onboard computer that monitors your vehicle's systems. Connect the CodeScout to your car's standard OBD port, and *you can actually communicate with the impish inhabitant*, who'll turn cryptic diagnostic codes into plain-English descriptions of your car's maladies!
$200, www.autoxray.com

STICKY POD

Mount your video camera to the Sticky Pod and attach it to any surface on your car—it's strong enough to hold on through hairpin turns, but releases without exterior damage. The crew for *March of the Penguins* are probably kicking themselves for not hooking this on their bumper so they could play *Mortal Kombat* inside a toasty RV while penguins frolic outside.
$60-$130, www.stickypods.com

MEMORYFRAME WIRELESS EDITION

This is the ultimate office accoutrement for the proud geek parent. Just like a PC slide-show screensaver, the 8x10 MemoryFrame displays up to 80 digital pictures (even more with the optional thumb drive) at 800x600 resolution. Configuring the device to display your images couldn't be easier, and you can update the MemoryFrame with new pics wirelessly!
$450, www.pacificdigital.com

UV DYE

Somewhere out in geek land, a water-cooling kit is running with just plain-ol' distilled water. And here sit three bottles of UV dye, waiting for their chance to light up a geek's water (and life) with glorious UV reactive qualities. Although it's just harmless dye, check your kit's warranty before purchase.
$9, www.crazypc.com

STEALTHSWITCH

Let's face it: Our web browsers sometimes find themselves on, *ahem*, not-so-work-friendly sites. A deft tap on the StealthSwitch's foot pedal will hide all your open windows and mask their presence on the taskbar. You can even program it to open "I'm hard at work" applications when snoopy Sally from Accounting strolls in.
$40, www.stealthswitch.com

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GIFTS FOR GEEKS

FORERUNNER 301

We know that most geeks' idea of exercise is *running* benchmarks or *surfing* the web, but for the few, the proud, the physically active, there's no better gift than Garmin's Forerunner 310. Walking, running, cycling, whatever, the GPS-equipped wrist band tracks your every move, displaying your pace, time, distance, even heart rate. Use the bundled *Training Center* software to personalize your regimen.

$325, www.garmin.com

ACTION II ROLLING BACKPACK XL

We don't know what the minimum requirements are to be considered an official "Transformer," but the Rolling Backpack XL must surely meet them. What appears to be a sturdy, laptop-toting backpack becomes rolling luggage with a yank on the telescoping handle; and releasable side straps will nearly double the bag's capacity for those last minute rampages through the duty-free shop.

$60, www.pacificdesign.com

EGG AND MUFFIN TOASTER

If the founding fathers had been geeks, Thanksgiving would be celebrated today with a bag of Doritos and a tub of French onion dip. Rise, pilgrim, and experience contemporary *haute* nerd cuisine with a contraption that cooks eggs—hard-boiled, poached, or scrambled—while simultaneously toasting muffins and warming Canadian bacon for LAN-party oohs and aahs.

$50, www.eggandmuffintoaster.com

P-51D MUSTANG RTF ELECTRIC

Open up a whole new universe of potential geekdom for the PC pilot on your shopping list with this sweet, remote-controlled, electric P-51D Mustang. Everything needed to fly this puppy (save for a soccer-field-size open space) is included in the box. The ability to perform 40mph fly-bys is sure to please!

$230, www.parkzone.com

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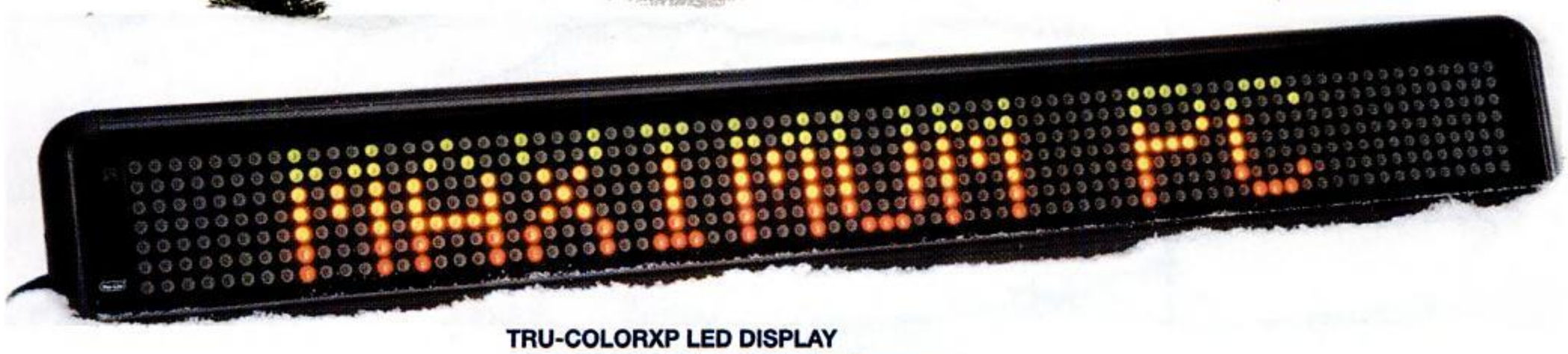

TRU-COLORXP LED DISPLAY

Real geeks advertise. Most by their indifference to personal grooming and indulgence in Star-anything. But others make a statement with a little more panache. Let your geek flag fly high, LED-style, with this 39.6x5.6-inch 16-color display. "Geeks Do It Virtually," or any other pithy message, can be programmed via the included infrared remote or the display's 9600-baud port. Yes, we said baud.
$795, www.pro-lite.com

WIRELESS PC LOCK

The holiday spirit is all about sharing, but that needn't apply to your PC. Lock up your rig Grinch-style with the Wireless PC Lock. Set it up and any time you're more than six feet away from your machine, the Lock senses your absence and renders your PC off-limits to interlopers. Once you re-enter the perimeter, your PC is back in business.
$30, www.frozencpu.com

G4000A AM/FM SHORTWAVE RADIO

Shortwave radio is your ticket to *instant* geek cred, and Grundig delivers it in style. Where else can you hear Cuban agitprop, Nigerian top-40 hits, and the mysterious and surreal "numbers stations" that are believed to be encrypted messages to spies? Shortwave radios are also handy in emergencies (read: Zombie Apocalypse).
$140, www.etoncorp.com

POWERSQUID OUTLET MULTIPLIER

Now that we've found the PowerSquid, we're ready to send our old, inadequate power strips packing. Sporting five flexible outlet extenders, this tentacled *tour de force* will accommodate any and *every* oddly shaped plug you throw at it. Wall warts? Bring 'em on!
$15, www.thinkgeek.com

MAXIMUM PC FLEECE

Geeks aren't known for stylish attire, but that could all change with the arrival of the Maximum PC fashion fleece. This handsome black long-sleeved pullover is soft on the skin, toasty warm, and boasts tasteful touches like a peek-a-boo zippered neck and embroidered Maximum PC logo on the arm. Available starting November 15.
$35, www.maximumpc.com

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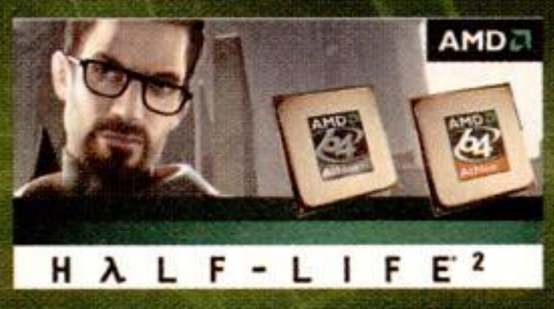
The AMD Athlon™ X2 dual-core processor enables everyone to do more in less time by delivering exceptional multi-tasking capabilities and increased performance on digital media.



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Asus K8V-X K8T800 Motherboard
AMD Sempron™ processor 3400+
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Antec SLK3700-BQE Black Quiet w/350W PS
ABIT AV8 K8T800 Motherboard
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DFI Lan Party UT nF4-D
AMD Athlon™ 64 X2 processor 4200+
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AMD Athlon™ 64 FX-57 (939)	$1011.00

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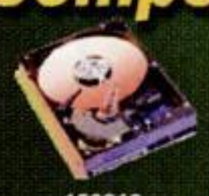

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$139.00

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$215.00

190490
BFG Geforce 7800 GTX OC 256MB GDDR3/PCI-E VIVO/Dual-DVI (Retail Box)
$499.00

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$229.00

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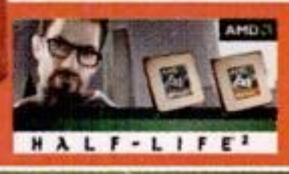

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- includes heatsink and fan
Choice of name-brand memory
Up to 3 name-brand Hard Drives,with optional RAID setup (1 or 0)
Up to 2 name-brand Optical Drives from CD-ROM upto Dual-Layer DVD Writes
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Corsair (VS1GBKIT333)
Western Digital 80GB SATA 8MB Cache
7200 RPM (WD800JD)
Lite-On SOHC-5232KCD-RW/DVD
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- includes AMD Certified heatsink
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Corsair (TWINX1024-3200XL)
Western Digital Caviar SE 250 GB SATAII 16MB Cache 7200 RPM (WD2500KS)
NEC ND-3540A 16X Dual Layer DVD±RW
Mitsumi Floppy 7-in-1 USB Card Reader
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Asus A8N-SLI Premium nForce4 Audio, GB-LAN, IEEE, USB, SATAII w/RAID, DDR-400, ATX
AMD Athlon™ 64 processor FX-57
Zalman CNPS7000B-AlCu Silent CPU Cooling Kit
2 GB DDR (2 pcs 1GB) PC-3200 (400) OCZ Dual Channel Platinum
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2 x Western Digital Caviar SE 250 GB SATAII 16MB Cache 7200 RPM (WD2500KS) w/RAID 0
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Mitsumi 1.44MB 3.5" Floppy Drive (Black)
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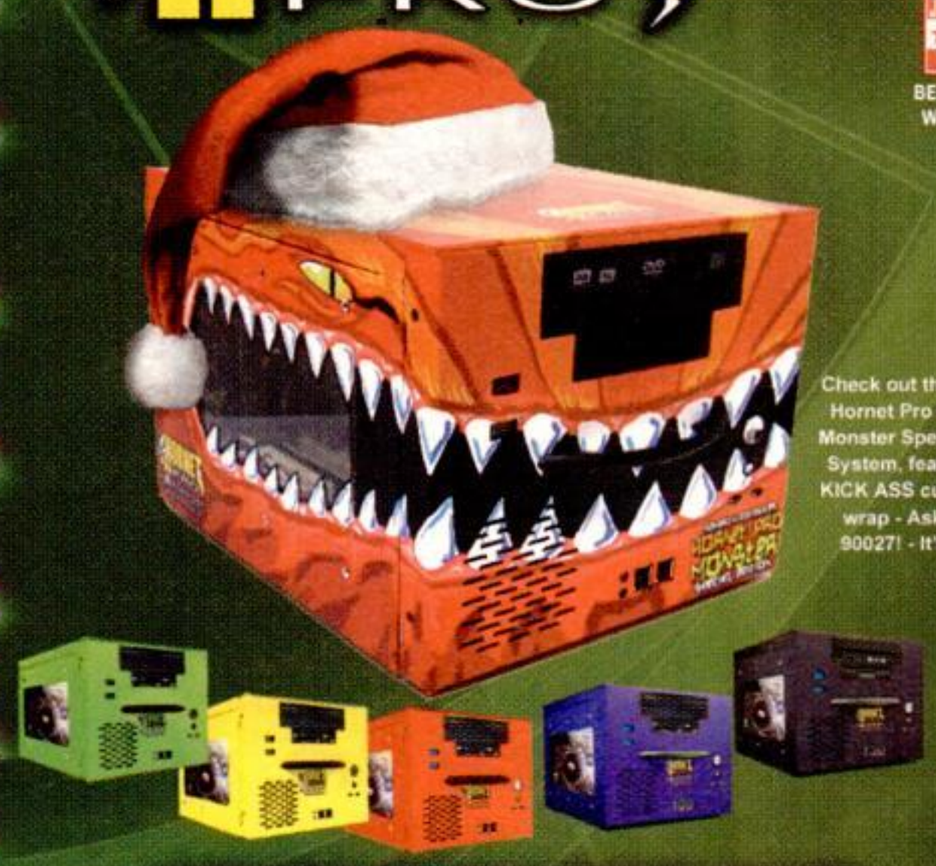

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Up to 2 name-brand Optical Drives from CD-ROM upto Dual-Layer DVD Writes
Choice of Floppy Drive
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Choice of name-brand sound card
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AMD Athlon™ 64 3500+ 512K 90nm (939)
AMD Certified Heat Sink Fan
1 GB (2 pcs 512) DDR (400) PC-3200 OCZ
Western Digital 80GB SATA 8MB Cache 7200 RPM (WD800JD)
NEC ND-3520A-KIT-BL 16X Dual Layer DVD±RW
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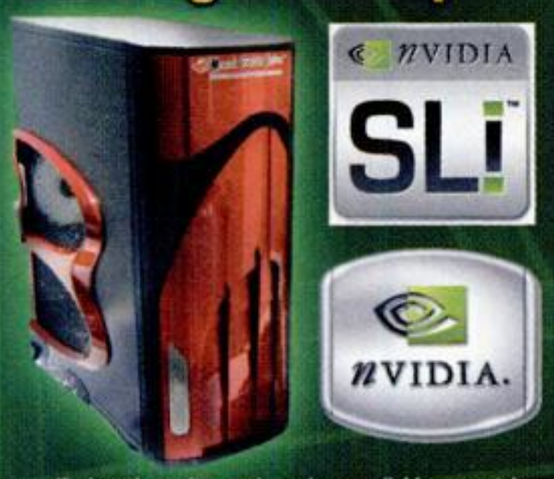

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Asus A8N-SLI Premium NForce4 SLI
AMD Athlon™ 64 FX-57 CPU
2 GB (4 pcs 512MB) (TWINX1024-3200XLPRO) Corsair
1 x WD 74 GB SATA HDD
2 x WD 250 GB SATAII HDD w/RAID 0 Setup
Plextor PX-716SA DVD±RW
Mitsumi Floppy 7-in-1 Flash Reader
2 x eVGA Geforce 7800 GTX 256MB GDDR3 PCI-E, TV-Out, Dual-DVI
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Pimp Out Firefox!

Extension Junction—what's your function? Find out what Maximum PC's top 20 Firefox extensions can do for you!

TIME 00:10 HOURS:MINUTES

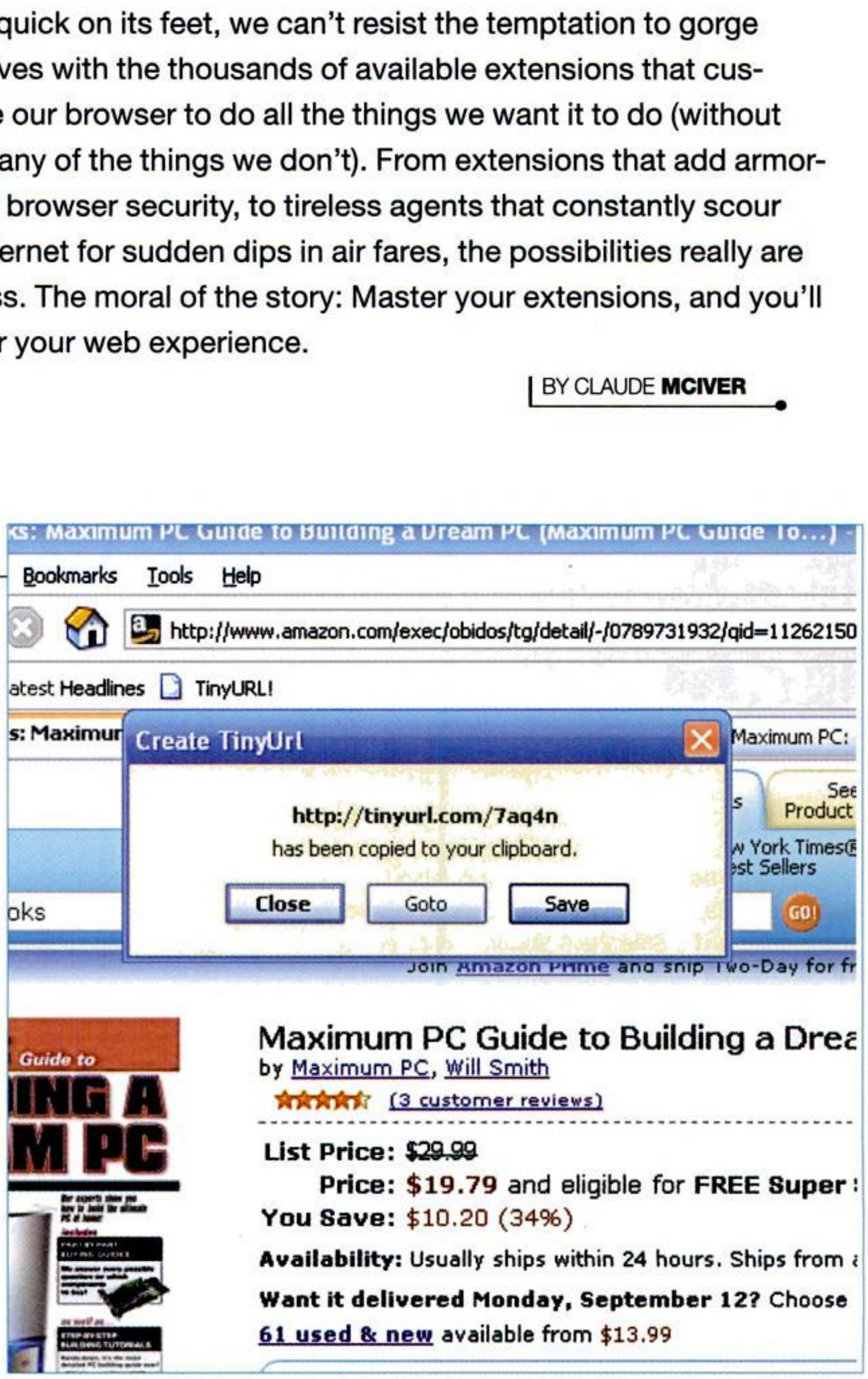
Folks, don't get us wrong: We're not *Internet Explorer* haters. We just love *Firefox's* tabbed interface and extensibility (a word that will not be used again in this article). Although the stock *Firefox* package installs a svelte, streamlined browser that's quick on its feet, we can't resist the temptation to gorge ourselves with the thousands of available extensions that customize our browser to do all the things we want it to do (without doing any of the things we don't). From extensions that add armor-plated browser security, to tireless agents that constantly scour the Internet for sudden dips in air fares, the possibilities really are endless. The moral of the story: Master your extensions, and you'll master your web experience.

BY CLAUDE **MCIVER**

Site Navigation

The miracles of miniaturization have had a profound impact on our lives, in computers, cellphones, and swimsuits, to name just a few examples. And now, even those annoyingly long URLs that crowd the web can be truncated to functional use. With the *Tiny URL* extension, a simple right-click allows you to transform the address of any page or link into a petite URL that you can save or share with others. And the best part is, these wee web addresses never expire, so you can send grandma a link to the super-cool gizmo you want from Amazon in a URL that won't leave her grappling with a four-line cut-and-paste nightmare.

While you're at it, save yourself some time by ditching the scroll wheel. As useful as it can be, the wheel is no match for *Scrollbar Anywhere*, which lets you scroll in any direction just by holding down the right mouse button. Your finger's already lounging there—give it something to do. Need more excitement? *Simple Rocker Navigation* allows you to go backward and forward through web pages without the burden of lifting your lazy-ass hand off the mouse. Holding the left mouse button and clicking the right button goes forward in your page history, while doing the reverse will go backwards in the history. Simple and effective, just the way we like it.



The RL in URL doesn't have to mean "really long," thanks to the magic of *Tiny URL*.

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More Fun with Site Navigation

The exceptionally daring might wish to demonstrate their *nav fu* by ditching the mouse altogether. Everyone knows that the Tab key jumps from one page element to the next—including links—and that pressing the Enter key submits field information and activates links. But the *Mouseless Browsing* extension completely liberates you from the little rodent by associating page elements with numbers. Just enter the number, press the Enter key, and *Firefox* responds as if you clicked the link. It's a great way to fly though web pages and give your clicking finger a break.

Windows Explorer has a handy "Up" button that whisks you up one level in the directory structure, so why shouldn't your web browser? You can stash *Go Up* on your toolbar, and with a quick click you can advance upwards in a website's directory—for example, using *Go Up* at **www.maximumpc.com/reviews** will take you directly to our home page without forcing you to backtrack with the Back button.

As if that wasn't godlike enough, *Aardvark* allows you to whimsically delete any element on a web page by simply placing the cursor over it and pressing R. Remove ads, pictures, text—anything you (don't) want. The power is *intoxicating*.

Now you see it, now you don't. View only what you want with *Aardvark*.

Security

You wouldn't leave the keys to your car on the hood, so don't leave the keys to your PC in your browser. *NoScript* allows you to permanently approve (white-list) sites you know are safe—like your bank's home page—and permits only those sites to execute Javascript. Access the preferences by going to the Tools menu, click Extensions, and click Options after highlighting *NoScript*. You can then add safe sites and configure advanced options. *NoScript* can even be added to the status bar, letting you allow or forbid the current site on the fly.

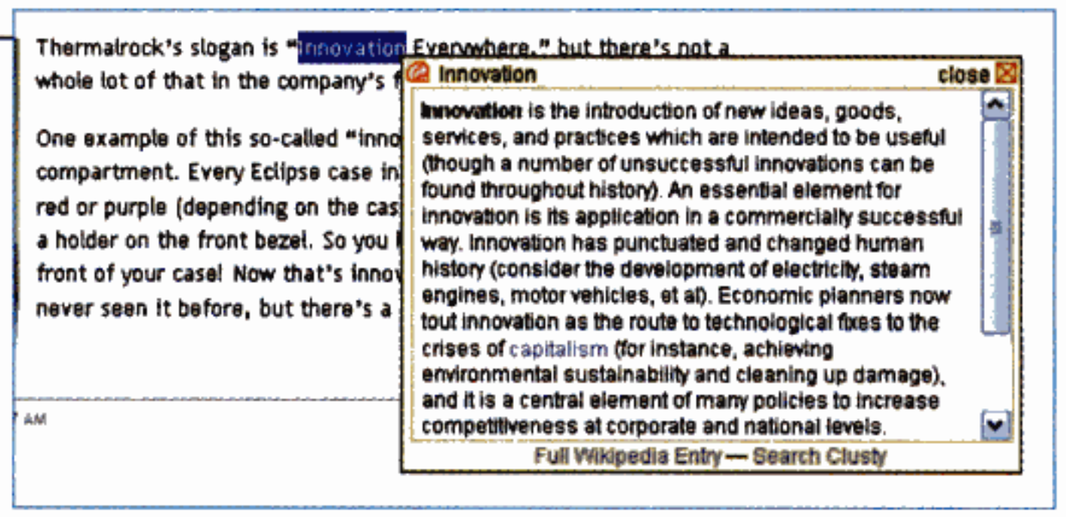
Block dubious sites or add trusted ones from the status bar.

Search

There are plenty of search toolbars that promise to give you the information you want, but *Clusty Toolbar* soars above the herd. It has the standard search input area that can search for and highlight keywords on the page; but what really sets *Clusty* apart is its link to the über-cool Wikipedia encyclopedia. Select any word or phrase on a web page, right-click, select Get Encyclopedia Clip, and you'll be served instant intelligence about the selected text from Wikipedia. The encyclopedia clip even opens in a small window, so you never have to leave your original page. If your curiosity is piqued, simply access the full Wikipedia entry via the link at the bottom of the clip window. Instant dictionary results as well as web searches for the selected text are also available. Groovy.

While you're at it, why not tweak Google to provide results with a perfect fit every time? You can do it with *CustomizeGoogle*, an ingenious extension that lets you take control of the world's most popular search engine. If the ads on the search results page are bugging you, simply remove them with a tick in the *CustomizeGoogle* option menu. Ads powered by Google will now disappear, and you can banish ads in *Gmail* as well.

CustomizeGoogle taps into every component of Google, including News, Groups, Images, and Froogle. It can even display links to other search engines based on your search criterion, right on the Google search results page!



***Clusty's* integrated Wikipedia tool makes quick work of serious research or casual web slumming.**

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Messaging

There exists an exotic species of hominid who communicates exclusively through text messaging, and they have the giant thumbs to prove it. You can establish diplomatic relations by sending text messages to their cellphones via email, but it's always a hassle because you need to know the carrier's domain, and in turn, the carrier itself. *Teleflip*, on the other hand, bridges the gap by allowing you to use any SMTP (outgoing) mail server to send SMS text messages to cellphones, so you don't have to know all the minutiae of your carrier's info.

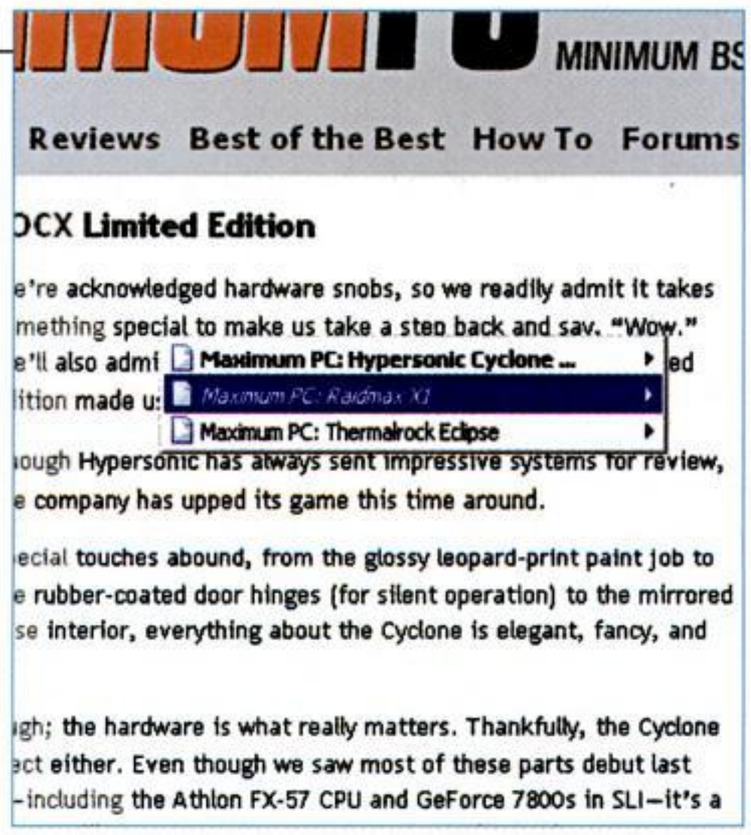
You can find your SMTP server information in the Accounts setting of your mail program, or in the Help section of your free web-based email service. First, access the *Teleflip* settings in the Tool menu. Input your email address, server information, username, and password and you're all set to text your heart out. To send a message, access the *Teleflip* tool in the Tool menu and click Send a Text Message. After entering the recipient's cell number and your message, hit OK. *Teleflip* then zaps your communiqué over the net and into the airwaves.

Absent-minded ambassadors can take comfort in *Der Browser Timer*, der best way to remind yourself to send a thoughtful message, with a countdown-style timer or audible and visual alarms that jog your memory at regular intervals.

Time Savers

Tabbed browsing is just plain cool—how did we ever live without it? The same can be said about a nifty little extension that makes switching between tabs even easier—the *Tab Scroller*. Just hold the right mouse button down and move the scroll wheel, and the page names of every tab will be displayed in a popup menu. Use the scroll wheel to select the desired tab and, voila, you're there. It's quick and makes life easier, especially if you're an incorrigible tab-maniac.

Autocopy takes the Control-C out of copying text. When active, any text that's selected with the cursor is automatically copied to the clipboard. *Autocopy* can be configured to turn on or off via the status bar, context menu, Edit menu, or all three.



A turn of the scroll wheel is now all you need to change from tab to tab.

Fares, Weather

If you're constantly leaping from airport to airport, or even if you're just planning an upcoming vacation, the *FareWatcher* extension is a great way to stay abreast of the best airline prices. The extension sits on the status bar and relays customized fare results via RSS from Farecompare.com. The Settings menu allows you to tailor the results by limiting price and specifying the airline and service type (coach, business, or—you lucky bastard—first class). It's currently limited to domestic flights within the U.S., however.

ForecastFox is like having your own personal meteorologist hanging out on your status bar. Powered by Accuweather.com, this extension shows current and forecast weather as well as regional satellite information. Plus, you can create profiles defining location and unit of measure; so you can get the weather in your hometown in Fahrenheit and then effortlessly check the conditions in Glasgow, in Celsius, just by switching profiles. MPC

Ask the Doctor

Diagnosing and curing your PC problems

DIFFERENT DRIVE, SAME CD SNAFU

I have Plextor's 716SA SATA DVD burner, and it appears to dislike random CDs. At first I thought it was a problem with older, damaged CDs, because my computer would reboot spontaneously every time I got to disc

*four of **Baldur's Gate 2**. But I experienced the same problem on disc five of **The Bard's Tale**, straight outta the box.*

Suspecting I had a bum drive, I went out and bought a standard IDE CD-ROM drive—nothing fancy—and it does the same thing with the exact same discs.

I've got all the newest drivers and firmware for my BIOS. I also tried removing the SATA DVD drive, and yet I get the same error with the other optical drive. Any ideas?

—SPC Clark

From the description of your issue, it sounds like your motherboard is based on nVidia's nForce4 chipset. This product certainly didn't have the smoothest rollout. One of its early quirks was that it didn't play well with some optical drives, including Plextor's 716SA. Poor planning? Cultural differences? Only the Intelligent Designer knows for sure. But the Doctor suspects the cure for your ills is to reinstall your Plexy and upgrade its firmware with the most current version available on Plextor's website. Firmware version 1.08 ironed out virtually all issues the PX-716SA had with the nForce4 chipset.

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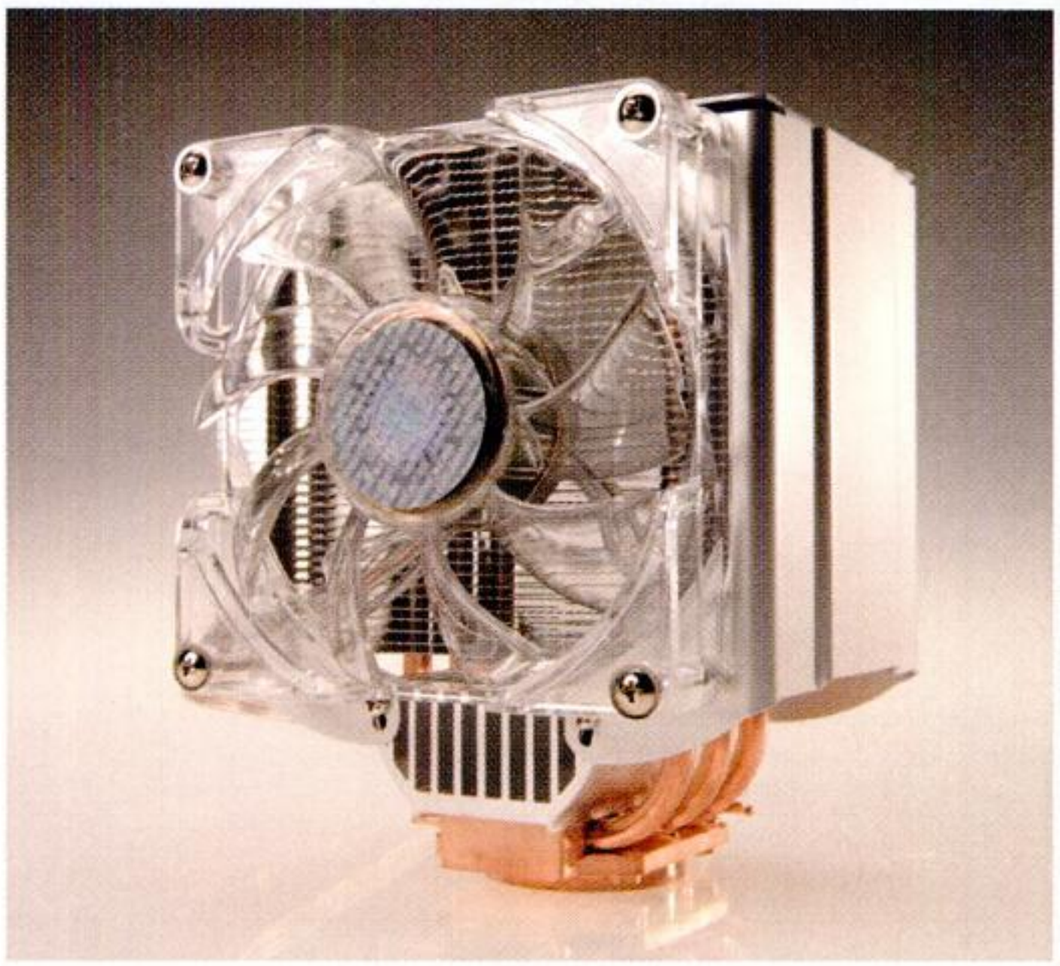

No amount of cooling will be enough if you forget to remove the protective cover from your heatsink.

EVIL MONKEYS

I built my first computer last year and it's running great, but with one problem: My CPU temp is out of control. I don't overclock, my mobo temps vary between 35 C and 45 C, and my case temps range from 31 C to 35 C. But my CPU idles at 47 C and heats up to 62 C under a full load. I shut down my PC at this point, so it might get even hotter if I left it on.

I originally installed a Thermaltake Venus, but after reading your heatsink showdown in the September issue, I noticed that the temps I'm getting are higher than I'd get with a stock heatsink and fan. I then bought the Cooler Master Hyper 6+, but now my idle CPU temps are 48 C and 62 C at full load. Are these high temps caused by my case, a faulty heatsink/fan installation, or the evil monkey that lives in my closet?

—Jeremiah Teague

The readings you're getting with the Hyper 6+ do indeed seem very high—they're not so high that you need to shut down your PC, but they're much higher than they should be. We got temps of 33 C at idle and 44 C under load on our AMD test bench with the Hyper 6+. Here are some troubleshooting tips: As silly it might sound, the first thing you should do is make sure you removed the clear plastic cover from the bottom of the heatsink. Yeah, it's a newb mistake, but we've all made it.

Next, make sure you're using the appropriate Tic-Tac-size drop of thermal paste and that you've ratcheted the cooler down nice and tight to the motherboard. You should also double-check the fan to make sure it's spinning. Finally, the Doc wonders what you're using to monitor your temperatures—there's an outside chance it's reporting erroneous info. We suggest using a second utility just to verify the temps, such as Alfredo Comparetti's *Speedfan*. As for the evil monkey in your closet, see if you can tranquilize him with a spiked banana and then call the zoo. If that doesn't work, give your neighborhood exorcist a ring.

REPAIR OR RECYCLE?

I recently bought a Dell Inspiron 8000 laptop from a friend. It has a 1GHz Pentium III and 512MB of RAM. I'm using the Dell power adapter and what looks to me like the original Dell batteries. After the machine has been running for a while, the entire left side of the screen gets very dark. The right side is unaffected, and adjusting the brightness and contrast has no effect. What's even stranger is that the problem goes away as soon as I pull the power-supply plug and switch to batteries; when I plug the power supply back in, the trouble returns. What could be causing this? Can it be fixed?

—David Elstein

This is a complete guess, but the Doc suspects that something has gone awry with the machine's panel connection, backlight, or motherboard. Yeah, that's a pretty broad diagnosis, but any one of these components could be at the root of your symptoms. The uniform light loss you describe might be intermittent backlight failure. You'll find plenty of aftermarket Inspiron 8000 parts, so you might want to replace the backlight or even the entire panel. Dell offers helpful instructions here: http://support.dell.com/support/edocs/systems/plav/sm/ (click "Removing and Replacing Parts").

But here's the bottom line: You can fix your laptop, but is it really worth it? Considering that brand-new—and faster—notebooks are priced in the $600 range, it might not be.

UNIVERSALLY SUCKING BUS

*I have had two different disk drives installed in a USB 1.0-to-IDE box. I now have a new USB 2.0 unit with a third disk. I have plugged all these units into at least a dozen different systems and I consistently get "Delayed Write Failure" errors. I use this unit on a regular basis to transfer files between my system and those of my friends and coworkers. When the drives decide to misbehave, it's impossible to transfer files. You can't just go back into Windows Explorer and re-access the drive—you're forced to unplug and replug, and most of the time even that doesn't help. I have taken the usual steps of running **Scandisk** and reformatting the drives, but no problems are reported and there's no change in behavior. Isn't this supposed to be a mature technology? What do I have to do to get reliable performance?*

—Frank Orazem

The Doc has used plenty of USB 2.0 external drives and rarely encounters delayed write failures. Having said that, delayed write failure errors are difficult to diagnose, because there can be any number of causes. When dealing with an external drive, however, the most common problem is a simple loss of communication between the host and the disk drive. This occurs most often when you're transferring large files; it can be caused by a faulty drive losing its connection with the host's drive controller, or the controller losing its connection with the motherboard chipset. Another culprit might be other USB traffic sucking up too much bandwidth during file transfers.

As a first step, the Doc recommends that you make sure there's no other USB activity while you're transferring files. Next, download the latest chipset driver for your motherboard, which will include USB drivers. If that doesn't solve the problem, visit your drive manufacturer's website and download a diagnostic utility to test your disk drive. If the new chipset drivers don't solve the problem, and you're sure there's no other traffic on the bus during file transfers, you probably have a defective drive. MPC

De-evolution or Unintelligent Design? Whatever the source of your PC tribulations, the Doctor is here to help. Send an email describing your problem to **doctor@maximumpc.com** and he'll do his best to come up with a meaningful solution.

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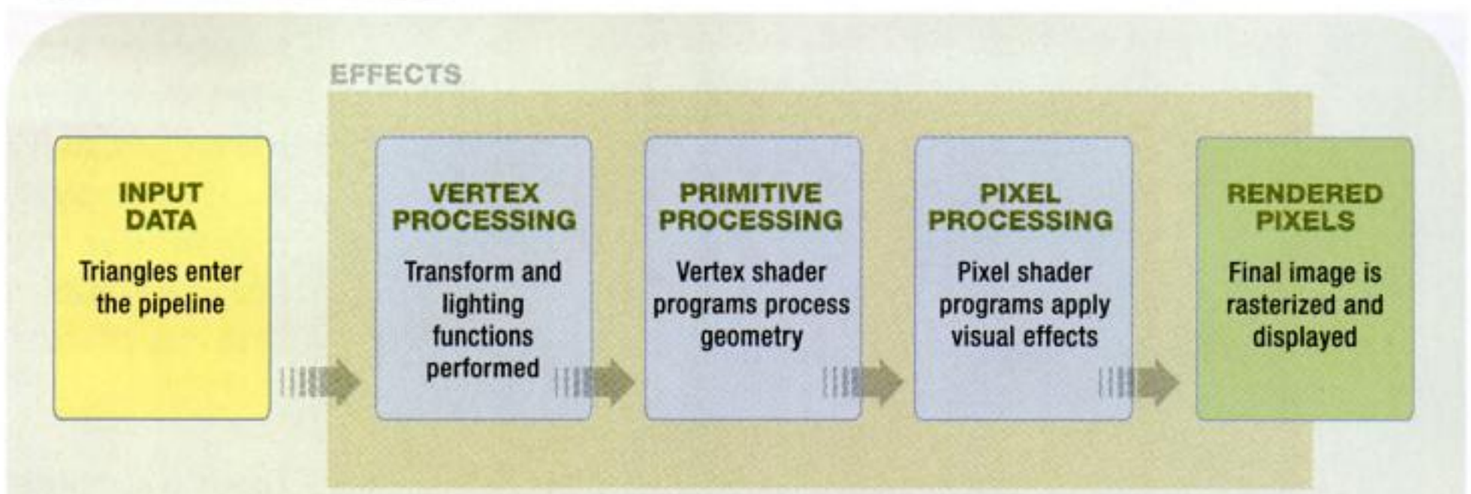
White Paper: Direct3D's Shader Model

DirectX's programmable shaders enable game developers to create incredibly detailed and realistic 3D models. Here's how they accomplish that feat

BY MICHAEL **BROWN**

HOW IT WORKS **The Shader Model 3.0 Pipeline**



►In Shader Model 3.0, the vertex shader does much of the heavy lifting in order to create three-dimensional objects. The pixel shader performs the equally intensive task of applying color, lighting, shadows, and other special visual effects to 3D objects.

Microsoft's Direct3D is the application program interface (API) that enables software developers to write code without having to worry about what kind of videocard the end user will run it on. Rather than having to create a specific version of a program for each of the unknowable varieties of 3D accelerator, developers need write only one version: for Direct3D.

One of the most important elements of Direct3D is Shader Model 3.0, which consists of two components: Vertex Shader 3.0 and Pixel Shader 3.0. The Vertex and Pixel Shader specs describe the programming language that shader programs use. Shader programs are small, highly specialized chunks of code that developers can use to manipulate vertices and pixels, wrapping detailed texture and displacement maps around relatively simple, wire-frame 3D objects to provide the illusion of depth and complexity, while keeping down the hardware demands of the scene.

The shader programs (also called shaders) in Shader Model 3.0 are many times more powerful than in previous generations. In Shader Model 2.0, for example, pixel shaders were limited to a maximum length of 96 instructions. In Pixel Shader Model 3.0, developers can write shaders of unlimited length, while vertex shaders in Vertex Shader Model 3.0 can contain up to 65,536 instructions.

nVidia (with its 6- and 7-series GPUs) and ATI (with its new X1000-series GPUs) both support Shader Model 3.0 in hardware, so you can expect to see many more games taking full advantage of this technology.

Now that we've established what these elements are and how they're related, let's dive into a more detailed explanation of how Shader Model 3.0 operates.

ENTERING THE PIPELINE

You can visualize the shading process as a pipeline, with rudimentary-looking objects entering one end and richly detailed objects exiting the other. Each object is defined as a set of triangles, which are in turn defined by the vertices (a vertex is a point in 3D space with X, Y, and Z coordinates that identify its location). As the objects move through the pipeline, shader programs operate on them in assembly-line fashion to create the complex images you'll ultimately see onscreen. Vertex shaders operate in the geometry-processing stage of the pipeline, while pixel shaders operate later, in the rendering stage.

Programmable shaders are incredibly more versatile than yesterday's fixed-function pipelines. Programmable shaders enable developers to create unique visual effects by simply loading new software instructions into shader memory. What's more, programmable shaders can be applied selectively, so that they function either on every object moving through the pipeline, or only on objects with certain characteristics, say, reflective objects.

VERTEX SHADER 3.0

A vertex shader's first order of business is to perform transform and lighting (T&L) functions. During the transform process, the object might be scaled, rotated, or positioned relative to other objects in the scene. The lighting step calculates how light sources will impact each of the triangle's vertices, taking into account the color and brightness of each light in the scene.

Programmable vertex shaders can do much more than T&L operations, however; they enable programmers to create a virtually unlimited number of visual effects, everything from swaying grass to the way a superhero's cape blows in the wind. They're also very flexible—a programmer can use a programmable vertex shader to process a bunch of tasks in parallel, or to apply all the shader engine's computational power on a single task.

With Shader Model 3.0, programmers can use vertex shaders to create complex character animation, too. They can assemble detailed skeletons, attach flexible muscles to the bones, and then extend skin and clothing over this framework so that everything properly stretches, wrinkles, and creases at the joints and around the face. Vertex shaders can be used to create thick smoke or ground-hugging swamp fog. Because vertex shaders are programs, developers can even apply these effects selectively based on the elevation of each vertex in

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an object; for example, tall objects—such as trees or buildings—can poke up out of the fog or smoke.

PIXEL SHADER 3.0

Once an object has gone through the geometry-processing stage of the 3D graphics pipeline, it moves into the pixel-processing stage. At this point, the 3D model is rasterized, or broken down into individual pixels. Because the image you ultimately see on your computer display will be composed of pixels, giving programmers the ability to control lighting, color, and shading effects at this level enables them to create highly realistic objects, characters, and environments.

Displacement mapping is one of Pixel Shader 3.0's most important features. Before they could use displacement maps to add complexity to in-game models, game developers would use bump-mapping to give flat objects the appearance of height. Rather than build a complex 3D model with hundreds of triangles, they'd create a simple 3D model and wrap a bump-mapped texture around it.

But the illusion of height that bump-maps provide quickly breaks down when you examine the object from multiple angles. Light shining on a bump-map doesn't cast shadows properly, which throws off the whole effect. With displacement mapping, the actual shape of the model is changed, which results in accurate shadows, no matter which direction the light source is coming from.

SHADER MODEL 4.0, ANYONE?

In many ways, vertex shaders are like skilled carpenters who specialize in framing a house. You don't see much of their finished product, but they're responsible for building the elaborate framework that holds up the building. Continuing this analogy, pixel shaders are akin to the equally skilled finish carpenters who install the elaborate crown molding, hardwood floors, and granite countertops that separate a custom home from one with wheels on the bottom.

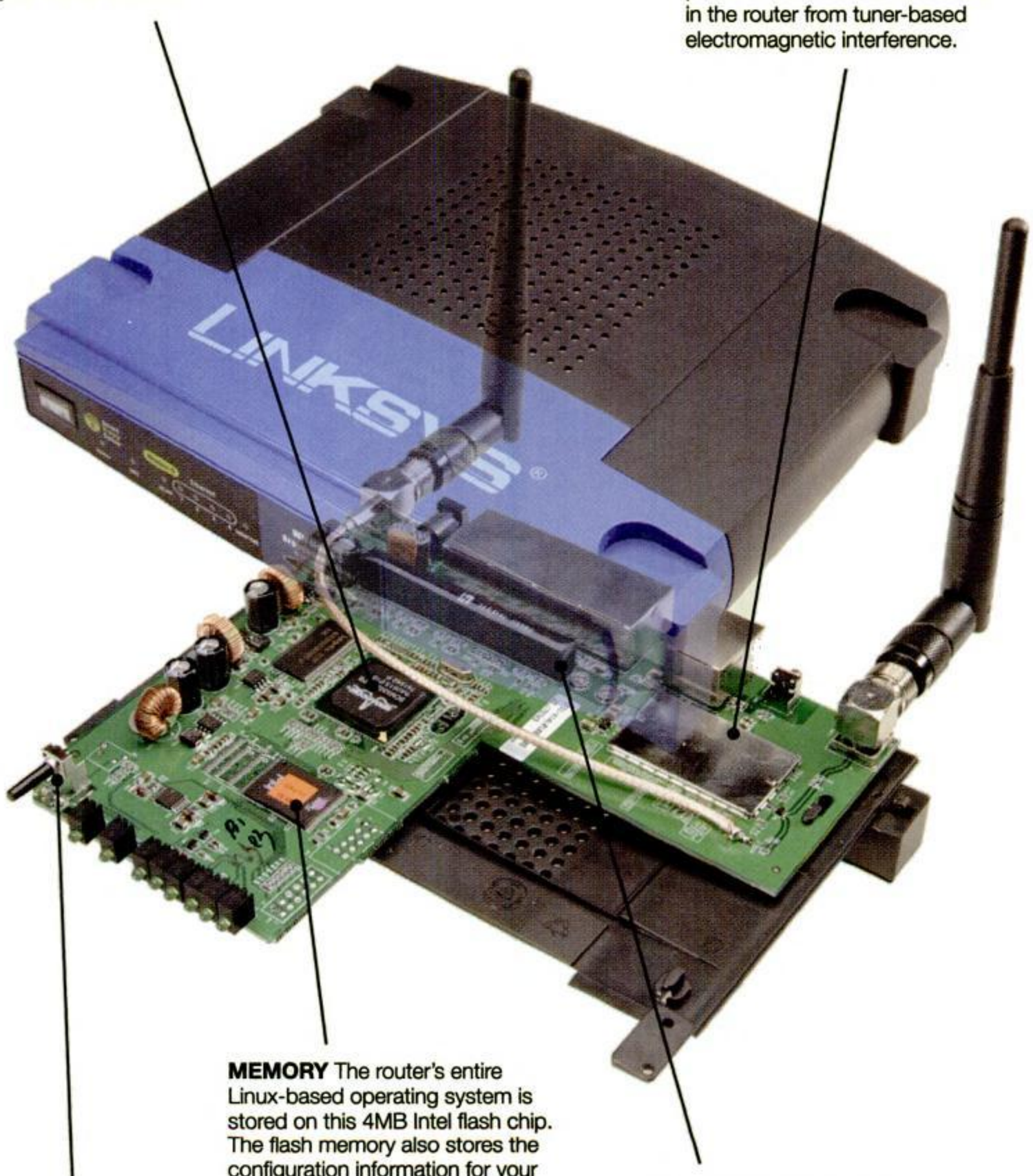
The next step in the development of DirectX will undoubtedly include a new set of shader models with features we can only guess about at this point. We've already heard hints of a Geometry Shader, designed to create massive volumes of vertices for things like fur and scales. We expect to see new additions to the Shader Model around the time DirectX 10 and Windows Vista ship, late in 2006.

Wi-Fi Router

A good broadband router is a must-have accessory for any high-speed connection, but what makes a router tick? We peel back the cover to find out

CPU This CMOS chip is the Broadcom BCM5352E, an all-in-one integrated MIPS processor that handles the 802.11g signal and 100Mbit Ethernet switching, and still has enough processing power to route all the network traffic in and out of your home network.

TUNER The Broadcom BCM2050—a 2.4GHz tuner and signal amplifier—lies under this tuner can. The metal can protects the sensitive electronics in the router from tuner-based electromagnetic interference.



MEMORY The router's entire Linux-based operating system is stored on this 4MB Intel flash chip. The flash memory also stores the configuration information for your connection, so your settings stay put even if the power fails.

SECRET BUTTON This button is hidden behind the Cisco logo on the front of the router. It's used to activate the router's SecureEasySetup feature. Instead of typing annoying WEP or WPA keys, SecureEasy lets you connect to the network with the press of a button. We expect to see a spec for one-touch configuration ratified by the Wi-Fi alliance sometime next year.

SWITCH COUPLER The magnetic switch coupler keeps the signals separate from each of the router's four internal LAN ports, and routes them to their final destination. Without a coupler, all of the computers connected to the router would have to share bandwidth, instead of each having a dedicated 100Mb/s connection.

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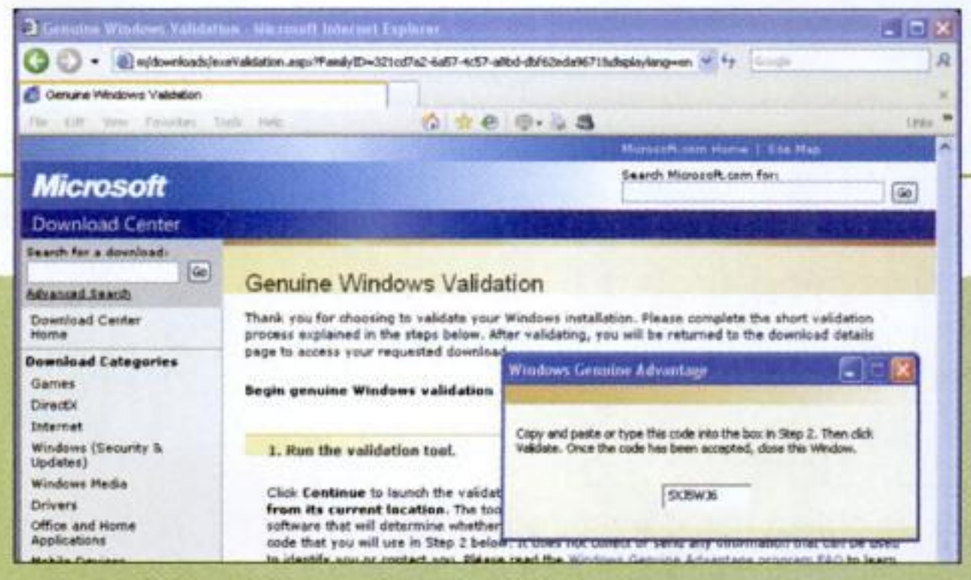
Preview

Internet Explorer 7

Microsoft is adding a long list of security enhancements and usability features to its web browser



One of *IE7's* new security features requires all pop-up browser windows to have address bars, so users can verify a site's legitimacy. But the rule apparently doesn't apply to Microsoft's Windows Genuine Advantage initiative.

Maximum PC recently snagged a copy of Microsoft's *Internet Explorer 7* Beta 1, which the company has released for developer and website-publisher testing. Microsoft describes most of the changes in this early pre-release version as being at a "plumbing level," and that most of the changes won't be clearly evident. But from our preliminary testing, our initial reaction is: "It's about time."

As in, it's about time Microsoft got around to embracing tabs; as in, it's about time Microsoft integrated a search toolbar; and as in, it's about time Microsoft did something about *IE's* porous security.

SECURITY IMPROVEMENTS

One of Microsoft's "plumbing" upgrades was to rewrite the code for handling URLs. One common *IE* attack strategy is to create an HTML link referencing a URL with odd or excessive characters. In the process of parsing the URL, *IE* will cause a system buffer overflow, which then allows the hacker's code to execute on the host PC. In the past, Microsoft's strategy was to issue an update each time such an exploit was discovered. Microsoft says its new data handler will prevent such scenarios from happening in the first place.

Another common hacker trick is to mislead users into thinking they're looking at information from a trusted source by spoofing a company's website. In *IE7*, every browser window will require an address bar, giving the user a visual clue as to which domain they're actually visiting.

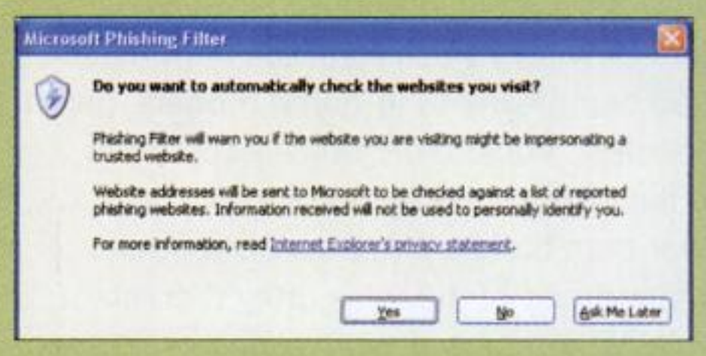
NEW PHISHING FILTER

Phishing schemes, in which criminals endeavor to fool consumers into revealing confidential information such as user IDs and passwords, have become a plague.

One of Microsoft's new strategies will be to build a new Phishing Filter into *IE7*. The company describes this as an "opt-in" feature because it remains in the background until you visit a site that the browser considers suspicious. If you activate the Phishing Filter it will conduct three checks on each website you visit. The site will first be matched against a list of known legitimate sites that is maintained on your own computer. If the URL is not on that list, the filter will analyze the site to determine if it exhibits characteristics typical of a phishing site. It will next match the website against an online database that contains both trusted sites and known phishing sites. Microsoft tells us the database will be updated several times each hour, so that it always contains the latest information.

If a site is suspicious, a yellow warning window will pop up from the padlock icon. If the URL is on the list of sites known to be fraudulent, a red pop-up will appear and the browser will immediately navigate you away from the site (you can override this, if you so choose).

If you happen to be the owner of a site Microsoft has labeled as either suspicious or a known phishing site, a browser tool will give you the opportunity to challenge the classification. Microsoft claims these false positives will be rare, and that if its analysts and the website owner are unable to agree on a resolution, the dispute will be forwarded to Microsoft's legal counsel.



***IE7's* new Phishing Filter will compare the websites you visit with a list of trusted sites (maintained on your PC) and a database of known phishing sites (maintained on Microsoft's site).**

USER INTERFACE CHANGES

Microsoft is also making some long-overdue changes to *Internet Explorer's* user interface. Three of these changes can be seen in Beta 1.

The program is visually sleeker, with fewer toolbars, and *IE7* will finally offer tabbed browsing. In Microsoft's implementation, clicking an "empty" tab in the tab toolbar will open a new tab in the current window; *IE7* can be configured so that clicking website links will also open a new tab, as opposed to loading within the current window.

Search-engine users will appreciate the inclusion of a search window that's integrated into *IE7's* toolbar. Beta 1 can be configured to use search engines from AOL, Ask Jeeves, Google, MSN, or Yahoo. The final release will allow you to use any search provider you'd like.

WHAT'S NEXT

Microsoft will integrate *IE7* into Windows Vista, which is expected to ship in the second half of 2006. It's reasonable to expect a stand-alone version of the new browser sometime before then. MPC

If the final version of *IE 7* looks anything like Beta 1 (bottom), web surfers can expect a simpler but much more useful toolbar. Improvements will include tabs, an integrated search window, and far fewer buttons.

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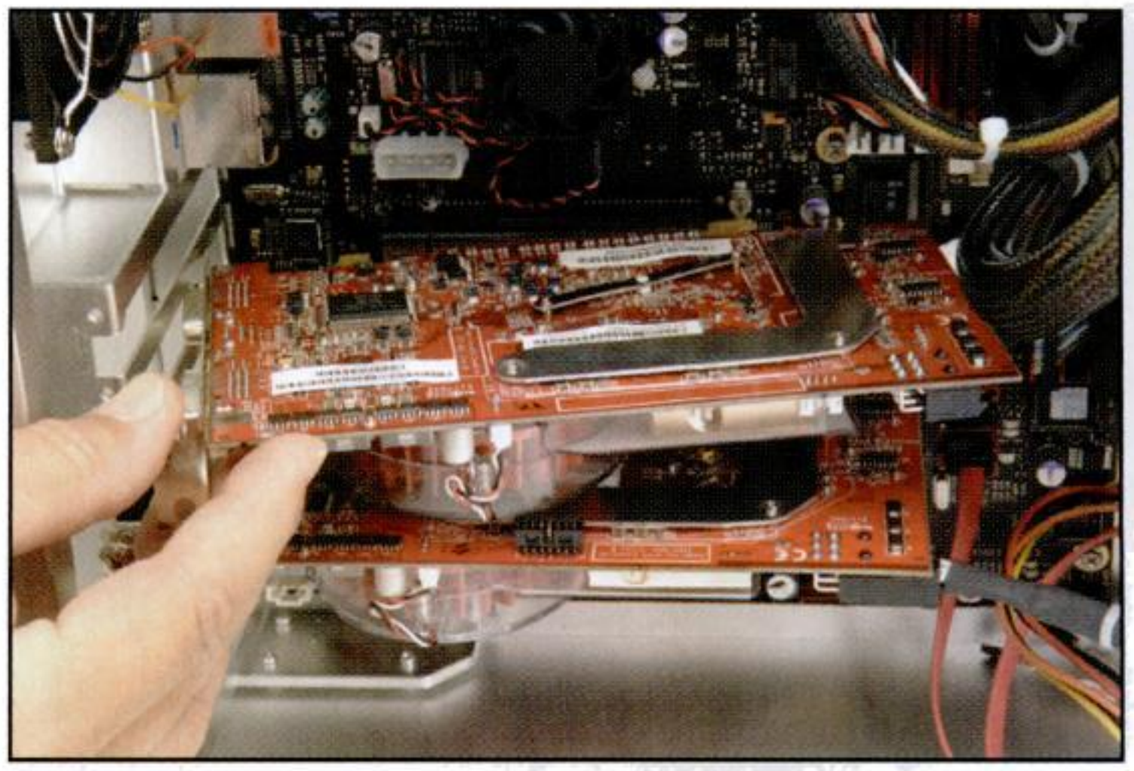
MICHAEL **BROWN**

Benchmarks CrossFire

ATI's dual-GPU launch is greeted by the sound of one hand clapping



Yes, Virginia, there really *is* a CrossFire Edition motherboard and videocard.

It has finally arrived: A CrossFire reviewer's kit. CrossFire *is* for real. All I needed to do was build it. I was curious to see how a single X850 XT CrossFire edition card would perform, so I held off installing the companion card. But the first time I powered up the system, Windows immediately blue-screened. After poring over the installation guide and troubleshooting everything I could think of—real reviewers don't need tech support—I finally gave up and called ATI.

"Did you plug the dongle into the vacant PCI Express slot?" they asked. "D'oh!" I responded. ATI's PR person had sent an email warning reviewers about the dongle—which instructs the motherboard to operate the remaining PCI Express slot in x16 mode—because the company forgot to cover it in the installation manual. And I had promptly forgotten about the email.

With the dongle securely in place, the system booted and I was able to proceed with benchmarking. For whatever reason, the card proved to be just a hare's breath slower than a normal X850 XT (but the performance delta is so small that it's pretty much meaningless). When I was ready to replace the dongle with a second X850 XT, I was able to boot into Windows, but it was so unstable that many of the benchmarks crashed mid-run.

I ran through the usual troubleshooting routines—again. Growing more frustrated by the moment, I decided to reseat the cards—again. With a firm tug on what I *thought* was the edge of the X850 XT, I immediately felt a capacitor give way. Double "D'oh!"

Fortunately, I had a spare Sapphire X850 XT card. And fortunately, CrossFire allows you to mix and match videocards from different manufacturers—I couldn't have done that with two nVidia GPUs. But because the system still wouldn't boot, I became convinced that something had gone awry while installing Windows and the rest of my benchmark suite, so I repeated the entire sequence. This time, the system blue-screened during the Windows installation!

I called ATI again. "You must have a bad CPU," they assured me. "Can't be," I replied; "that CPU and RAM came from another PC that I knew was working, and when I put it *back* in that other machine, it still worked fine."

ATI finally agreed to send another motherboard. In the meantime, I installed a different CPU and different memory into the first evaluation system. Voila! The system booted without incident. As it turns out, ATI's product manager had had a similar experience with an Intel motherboard: The CPU worked fine in every other motherboard, and the motherboard worked fine with every other CPU. But the two just could not get along inside the same system.

As for performance, the CrossFire architecture holds its own against same-generation hardware. But there's little reason to even consider a CrossFire rig when nVidia's much faster, next-gen GeForce 7800 GTs are available for about the same price. The real question is this: Can dual R520s compete with nVidia's screamin' Mimis: dual GeForce 7800 GTXs running in SLI?

BENCHMARKS

	2X RADEON X850 XT	2X GEFORCE 6800 ULTRA	2X GEFORCE 7800 GT	2X GEFORCE 7800 GTX
3DMARK 03 OVERALL	20,468	21,820	24,810	**26,768**
3DMARK 03 GAME 2 (FPS)	41.4	54.4	64.1	**69.2**
3DMARK 03 GAME 4 (FPS)	67.8	65.9	89.2	**99.5**
3DMARK 05 OVERALL	10,398	10,168	11,047	**11,379**
DOOM3 (FPS)	68.1	74.3	81.2	**84.4**
FAR CRY (FPS)	122.1	120.0	124.1	**128.6**
HALO (FPS)	118.4	113.3	124.5	**129.1**

Best scores are bolded. ATI benchmarks run on an ATI reference-design, Socket 939, CrossFire Edition motherboard. nVidia benchmarks run on an Asus A8N SLI Deluxe nForce4 SLI motherboard. Both test beds equipped with 2GB of DDR SDRAM and 2.6GHz Athlon FX-55 CPUs. Halo 1.06 tested at 1600x1200 with sound disabled. Doom 3 v1.3 tested at High Quality, 1600x1200, 4x AA. Far Cry 1.33 and 3DMark03 Game 2 and Game 4 tested at 1600x1200, 4x AA, 8x aniso. 3DMark03 and 3DMark05 are run using default settings.

SPECS

VIDEOCARD	GPU	PRICE	MEMORY	PIXEL PIPELINES	CORE CLOCK	MEMOMRY CLOCK
ATI X850 XT PAIRED WITH ATI X850 XT CROSSFIRE EDITION	Radeon X850 XT on both cards	$700	256MB on each card	16 on each card	520MHz	540MHz
TWO NVIDIA GEFORCE 6800 ULTRA CARDS IN SLI	GeForce 6800 Ultra on both cards	$830	256MB on each card	16 on each card	400MHz	500MHz
TWO NVIDIA GEFORCE 7800 GT CARDS IN SLI	GeForce 7800 GT on both cards	$800	256MB on each card	20 on each card	430MHz	600MHz
TWO NVIDIA GEFORCE 7800 GTX CARDS IN SLI	GeForce 7800 GTX on both cards	$958	256MB on each card	24 on each card	400MHz	500MHz

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How We Test

Real-world benchmarks. Real-world results

Computer performance used to be measured with synthetic tests that had little or no bearing on real-world performance. Even worse, when hardware vendors started tailoring their drivers for these synthetic tests, the performance in actual games and applications sometimes dropped.

At *Maximum PC*, our mantra for testing has always been "real-world." We use tests that reflect tasks power users perform every single day. With that in mind, here are the six real-world benchmarks that we use to test every system we review.

SYSmark2004: This is the most comprehensive application benchmark available, using no fewer than 19 applications to measure the time it takes for the PC to complete to real-world computer-intensive tasks. Our *SYSmark* score is a composite based on the time the test takes to complete several different types of tasks.

Adobe Premiere Pro: The leading nonlinear digital-video editor has recently been retooled with more support for multi-threading. We take a raw AVI file, add several transitions and a soundtrack, export it to a generic MPEG-2 file, and then report the time the script takes to complete.

Adobe Photoshop CS: We don't subscribe to Apple's half-baked idea that running one filter test in *Photoshop*, in one certain way, at a particular time of day provides an accurate measure of performance. Instead, we take a high-resolution image and throw it through just about every filter available in *Photoshop CS* at it. Our score is the time it takes for the script to complete.

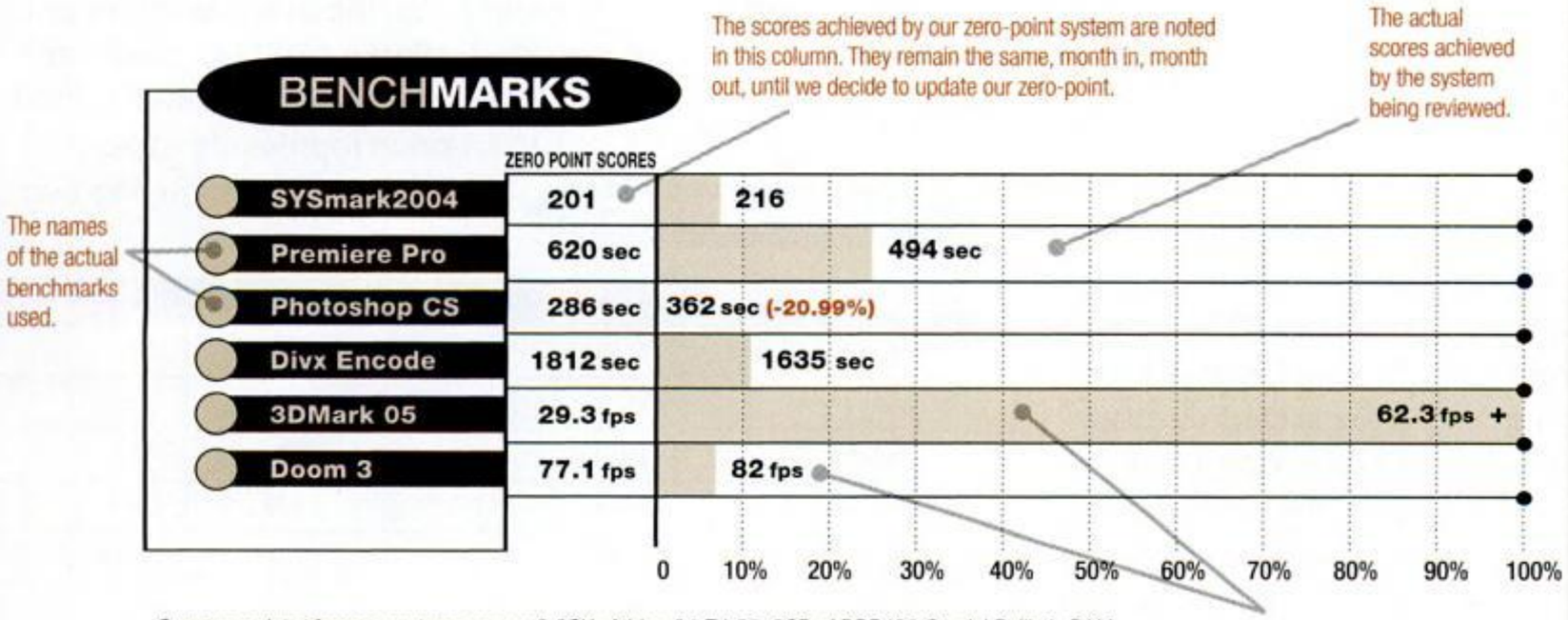
Divx Encode: Video encoding is today's time-suck. We transcode a short movie stored on the hard drive from MPEG-2 to Divx using *#1 DVD Ripper.* We report the length of time the process takes to complete.

3DMark05: After ranting about real-world tests, you might be surprised to find this "synthetic" graphics test in our suite. *3DMark05*, however, has proved to be the standard by which graphics cards and PCs that run them are judged. Instead of reporting a meaningless composite score, we run the third test at 1280x1024 with 4x antialiasing and 4x anisotropic filtering, then report the frame rate. Our zero-point system with SLI can't even break 30 frames per second.

Doom 3: Id's hugely popular game is a dark, scary, and serious test of PC horsepower. We run this game with 4x antialiasing and 4x anisotropic filtering, at 1600x1200 resolution, and report the frame rate.

How to Read Our Benchmark Chart

Maximum PC's test beds double as zero-point systems, against which all review systems are compared. Here's how to read our benchmark chart.



BEST OF THE BEST

Our monthly category-by-category list of our favorite products. New products are in red.

High-end videocard:
Asus GeForce N7800 GTX Top

Mid-range videocard:
GeForce 6800GT

Soundcard:
Creative Labs X-Fi Extreme Music

7,200rpm SATA:
Hitachi Deskstar 7K500

External backup drive:
Western Digital Dual-Option Media Center 250GB

Portable USB drive:
Seagate Portable External Hard Drive 100GB

DVD burner:
Plextor PX-716A

Widescreen LCD monitor:
Dell 2405FPW

Desktop LCD monitor:
Dell 2001FP

Socket 939 Athlon 64 mobo:
Asus A8N-SLI Deluxe

Socket 775 Pentium 4 mobo:
Asus P5ND2-SLI

Portable MP3 player:
Apple iPod 60GB

Photo printer:
Canon i9900

5.1 speakers:
Logitech Z-5500 Digital

2.1 speakers:
Klipsch GMX A2.1

Mid-tower case:
Cooler Master Praetorian 730

Full-size case:
Lian Li PCV-1100
With its newfangled reverse ATX design and super-quiet operation, the PCV-1100 rolled right into our hearts

Games we are playing:
Black & White 2, Quake 4, Dungeon Siege II, Battlefield 2

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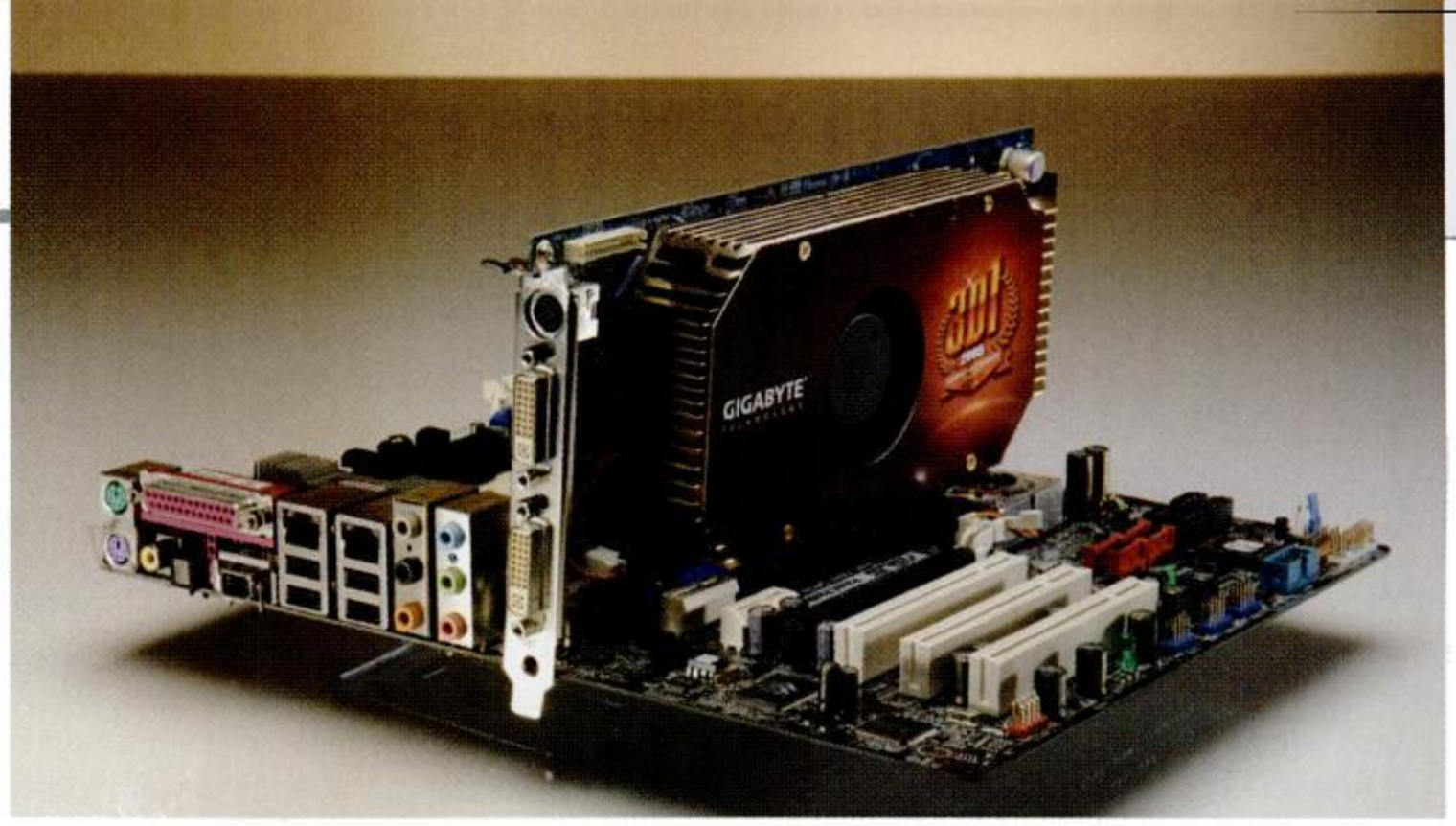
Gigabyte GV-3D1-68GT

Supersize me!



Gigabyte's hulking GV-3D1-68GT doesn't come with a mobo—we included it for scale. This dual-GPU card is as gargantuan as it is fast.

Gigabyte's first single-card SLI trick impressed us as a feat of engineering, but its performance left us cold. This time 'round, the company's engineers got almost everything right. The GV-3D1-68GT is not only faster than a single 7800 GTX, it's faster than two 6800 GT cards running in conventional SLI. The only problem: This behemoth weighs as much as six Quarter Pounders!

Gigabyte's original GV-3D1 merged two nVidia GeForce 6600 GT cores on a single card, but it was compatible only with Gigabyte's nForce4 GA-K8NXP-SLI motherboard—and could be purchased only as part of a $495 videocard/mobo bundle. Never before or since have two eight-pipe GPU, dual 128MB, 128-bit interface videocards been so freakin' expensive.

The GV-3D1-68GT pulls off the same engineering trick, but it pairs two much faster, 16-pipe GeForce 6800 GT cores (each running at 375MHz) and offers dual 256MB frame buffers (clocked at 500MHz and with 256-bit memory interfaces). The capper is that the new board is compatible with any nForce4 SLI motherboard.

The card's massive heatsinks and large fans account for much of the GV-3D1-68GT's astonishing two-and-a-quarter-pound heft.

All those components add up to some serious mass—and a need for some serious cooling: Heatsinks and fans mounted on both sides of the 10-inch-long circuit board contribute nearly two inches to its girth, and the entire package tips the scales at a staggering two pounds, 4.3 ounces (compared with 12 ounces for a standard 6800 GT card). Despite all this bulk, Gigabyte saw fit to provide just a single mounting bracket, which left the card keeling over in our mid-tower-mounted motherboard's 16x PCI-E slot. We recommend that buyers jury-rig some additional support for this monster's ass-end.

In fact, anyone who's considering installing the GV-3D1-68GT in their machine should take note of all its dimensions. The heatsink on the back of the card, for instance, came into contact with the supplemental 12-volt power connector on our Asus A8N-SLI Deluxe motherboard—we had to push hard before it would seat properly—and if we were utilizing the case's second hard drive cage, we would have run into even more problematic clearance issues. The aforementioned fans are loud—they stood out among all the other machines contributing to the Lab's cacophony—but at least they don't generate the type of high-pitched whine that sets your teeth on edge.

Two DVI connectors are installed on the mounting bracket, along with a video-out port. Anyone interested in editing their own analog videos should note that video-in is not supported. If you'd like to run four monitors—not in SLI mode, of course—you can plug in a second mounting bracket that's outfitted with a pair of analog VGA connectors. The card also supports dual Dual-Link DVI, so you can drive two 30-inch Apple Cinema Displays from a single card. Just like a conventional 6800 GT card, the board draws additional power through a six-pin plug (Gigabyte provides a Molex Y cable if your power supply isn't equipped with the appropriate cable).

As you can see from our benchmark chart, the GV-3D1-68GT handily beats the performance of both a single GeForce 7800 GTX and that of a pair of conventional GeForce 6800 GT cards running in SLI. In our test rig, the card ran *Doom 3* (at 1600x1200 resolution with 4x antialiasing and 8x anisotropic filtering)

SPECS

GPU	Dual GeForce 6800 GTs
PIXEL PIPELINES	16
MEMORY	512MB DDR3 (256MB per GPU)
MEMORY INTERFACE	256-bit
CORE CLOCK	375MHz
MEMORY CLOCK	500MHz

nearly three frames per second faster than two 6800 GT cards, 18.5fps faster than a single 7800 GTX, and 21.8fps faster than a single 7800 GT. Not bad.

At press time, the average street price for a single GeForce 6800 GT card was about $325, so the GV-3D1-68GT's $600 list price represents at least a $50 discount over buying two

BENCHMARKS

	GIGABYTE GV-3D1-68GT	GEFORCE 6800GT (SINGLE CARD)	GEFORCE 6800GT (SLI)	GEFORCE 7800GTX (SINGLE CARD)
DOOM 3 (FPS)	**71.5**	39.8	68.7	53.6
FAR CRY (FPS)	**112.7**	71.5	111.3	81.5
HALO (FPS)	106.2	63.3	93.4	**107.9**
3DMARK05	**9,656**	5,145	9,234	7,648
3DMARK03	**20,538**	11,945	19,544	16,074
3DMARK03 GAME 2 (FPS)	**52.0**	24.6	49.0	33.8
3DMARK03 GAME 4 (FPS)	**60.3**	28.1	56.6	47.9
HQV SCORE	68	78	68	**83**

Best scores in each category are bolded. All benchmarks are run on our Athlon FX-55 test system, which includes an nForce4 SLI motherboard and 2GB of DDR SDRAM. Halo 1.06 tested at 1600x1200 with sound disabled. Doom 3 tested at High Quality 1600x1200, 4x AA. Far Cry 1.31 and 3DMark 2003 Game2 and Game4 are tested at 1600x1200, 4x AA, and 8x aniso. 3DMark 2003 and 3DMark 2005 are run using default settings. HQV Score is derived from the HQV Benchmark DVD, which measures the videocard's performance displaying DVD movies.

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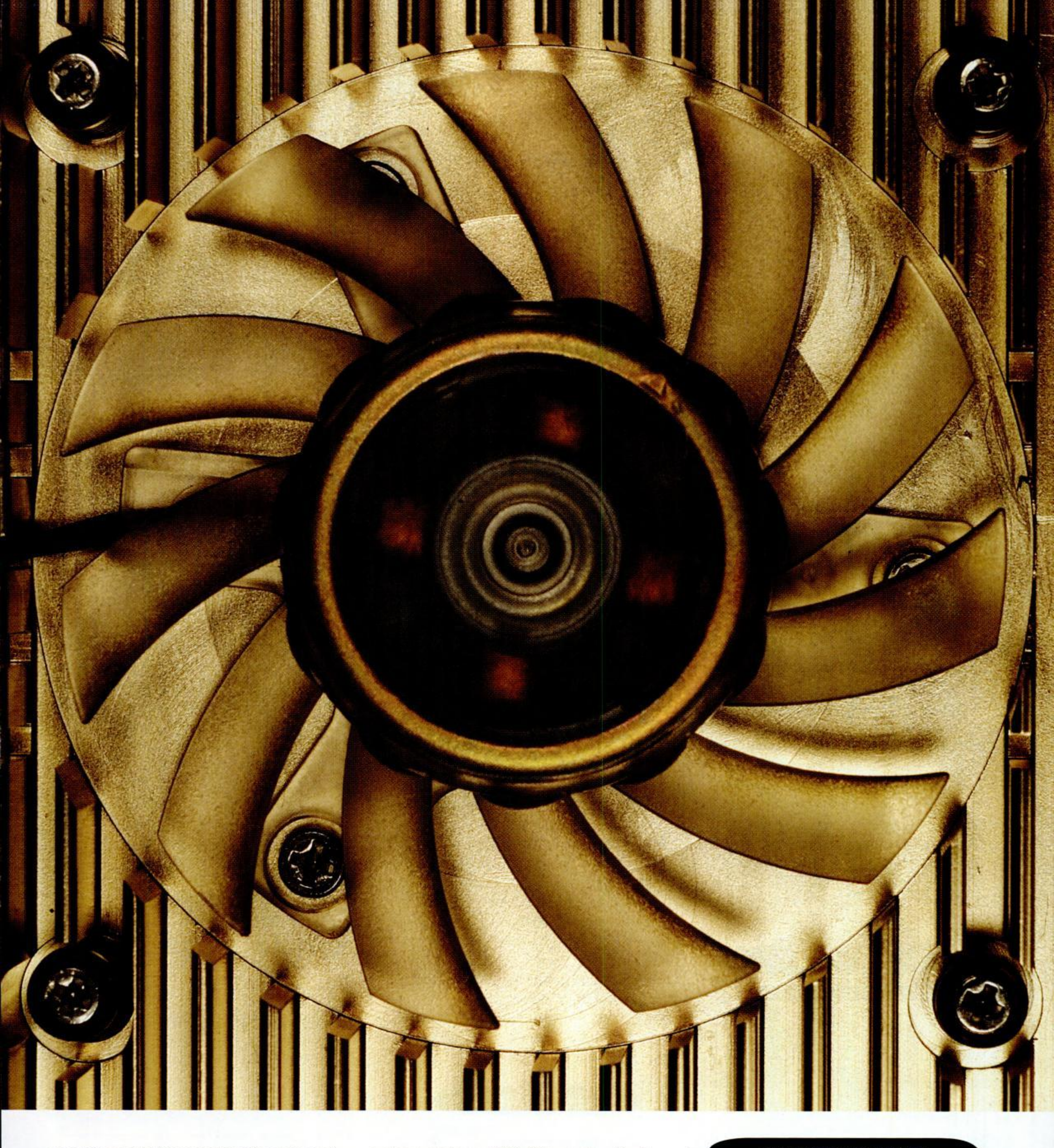

separate cards (thus overcoming our next biggest objection to its predecessor). On the other hand, you could pick up a single GeForce 7800 GTX for the average street price of $510, or a single 7800 GT for $400, and two of either of those cards in SLI will definitely leave Gigabyte's board with a poor body image.

To be absolutely fair to Gigabyte, however, two 7800 GTX boards cost more than a grand, and two 7800 GT boards will set you back more than $800. Compared with that, $600 for a board that beats the stuffing out of either single card is a good deal. Unlike those two boards, however, the only way you can further increase your PC's performance is to chuck this card and replace it with two more. Still, this card is a good value for the money.

—MICHAEL BROWN

GIGABYTE GV-3D1-68GT

SLY AND THE FAMILY STONE

Faster than a single GeForce 7800 GTX; cheaper than two GeForce 6800 GTs.

SLY STALLONE

Morbidly obese; obnoxiously loud. Slightly more expensive than a single 7800 GTX.

8

$600, www.gigabyte-usa.com

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Puget Systems Custom PC

Upwardly mobile, this rig hints at a promising future for Intel's Pentium M

Minimalists might dig the single videocard, single hard drive, and small, fast, Pentium M, but we need at least a couple hundred gigs of storage.

The Puget's ginormous radiator is the key to its fanless water-cooling solution.

While not officially sanctioned by Intel for desktop use, the Pentium M processor has long been coveted by fans of quiet PCs and small form-factor boxes, for the very reasons the mobile CPU has excelled in the notebook arena: low power usage and minimal heat output. This custom PC from Puget Systems is the first Pentium M-equipped desktop system we've reviewed and we were eager to see how the chip would fare against its Pentium 4 brethren and AMD competitors.

The heart of this system is the 2.35GHz Pentium M 780, which sports 2MB of L2 cache. It's keeping company with 2GB of DDR2/533 RAM, a single Western Digital 74GB Raptor, and a BFG GeForce 7800 GTX 256MB videocard. Most of the systems we've reviewed this year have incorporated some iteration of SLI, thus the lone GeForce 7800 card in Puget's PC seems paltry by comparison. Nonetheless, the GeForce 7800 is more than capable of playing today's games. Puget left sound duties to the onboard 7.1 channel HD audio controller, in lieu of the familiar Sound Blaster Audigy 2 ZS, but this isn't its biggest failing. Shipping a $4,700 system with only 74GB of storage is inexcusable; we'd rather see a quieter, nearly as fast 500GB Deskstar.

The stand-out feature in this rig is the Aqua-Computer Airplex Evo 1800 Radiator. This is the first fanless water-cooled system we've tested, and it's made possible by the beefy, probably-big-enough-to-cool-a-small-car radiator. The CPU, chipset, videocard, and hard drive are all cooled by the heavy-duty water-cooling kit, which looks impressive at work with purple UV-reactive dye running through its water lines. All hardware is housed in an elegant Lian-Li PC-767 case, perfect for quietude.

The Puget system batted pretty low in *SYSmark 2004*, for which we blame the Pentium M. *SYSmark* simulates multitasking in various applications, and without dual cores or even Hyper-Threading, the Pentium M just can't compete. Performance in *Premiere Pro* and *Photoshop CS* was more impressive, comparable to previous FX-55 systems we've tested. And the Pentium M 780 was able to encode our MPEG-4 test video as well as P4 systems with 1GHz faster clock speeds.

With its single 7800 GTX videocard, the Puget system couldn't compete with the big boys in our game benchmarks. Still, it summarily spanked single-card 6800-based systems and managed to crank out 1.6 more frames per second than our 6800 Ultra SLI-powered zero-point rig in the *3DMark05* benchmark. And a score of almost 41fps in *Doom 3* from a single card is definitely respectable, but we would have loved to see this system with a 7800 SLI configuration.

While the Pentium M provides good performance and runs cool doing so, the proc lacks multithread capability, SSE3 instructions, and 64-bit processing. So it's not surprising that Puget's custom system isn't a high-performance gaming PC. Instead, it's a high-performance *quiet* PC that allows the Pentium M to flex its gaming muscle. If your first concern is quiet operation, and you want something with a little get-up-and-go, then get up and go get this system. Otherwise, grab a system based on a full-throttle processor.

UNDER THE HOOD

BRAINS	
CPU	Intel Pentium M 780 (2.26GHz)
MOBO	Aopen A-i915GA-HFS
RAM	2GB DDR2/533
LAN	Gigabit Ethernet
HARD DRIVE	74GB Western Digital Raptor
OPTICAL	Plextor 716AL/SW Slot-loading IDE
BEAUTY	
VIDEOCARD	BFG GeForce 7800 GTX 256MB (450MHz core, 625MHz GDDR3)
SOUNDCARD	Onboard Azalia 7.1 channel HD audio
CASE	Lian-Li Classical Silent PC767, Antec Phantom 500W PSU
BOOT: 29 sec.	DOWN: 9 sec.

PUGET SYSTEMS CUSTOM PC

+ SILENT BOB

Ultra quiet, great case and aesthetic detailing, slot-loading DVD.

– RIOTING MOB

Not enough storage, No SLI, and the radiator is huge.

6

$4,730, www.pugetsystems.com

BENCHMARKS

	ZERO POINT SCORES	
SYSmark2004	201	179 (-10.95%)
Premiere Pro	620 sec	611 sec
Photoshop CS	286 sec	303 sec (-5.61%)
Divx Encode	1812 sec	1770 sec
3DMark05	29.3 fps	30.9 fps
Doom 3	77.1 fps	40.9 fps (-46.95%)

0 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Our zero-point reference systems uses a 2.6GHz Athlon 64 FX-55, 2GB of DDR400 Crucial Ballistix RAM, two nVidia GeForce 6800 Ultra cards in SLI, a Maxtor 250GB DiamondMax10, a Sound Blaster Audigy 2 ZS, a PC Power and Cooling TurboCool 510 Deluxe Express, and Windows XP Pro with SP2.

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TEEN T CONTENT RATED BY ESRB — Crude Humor, Mild Language, Simulated Gambling

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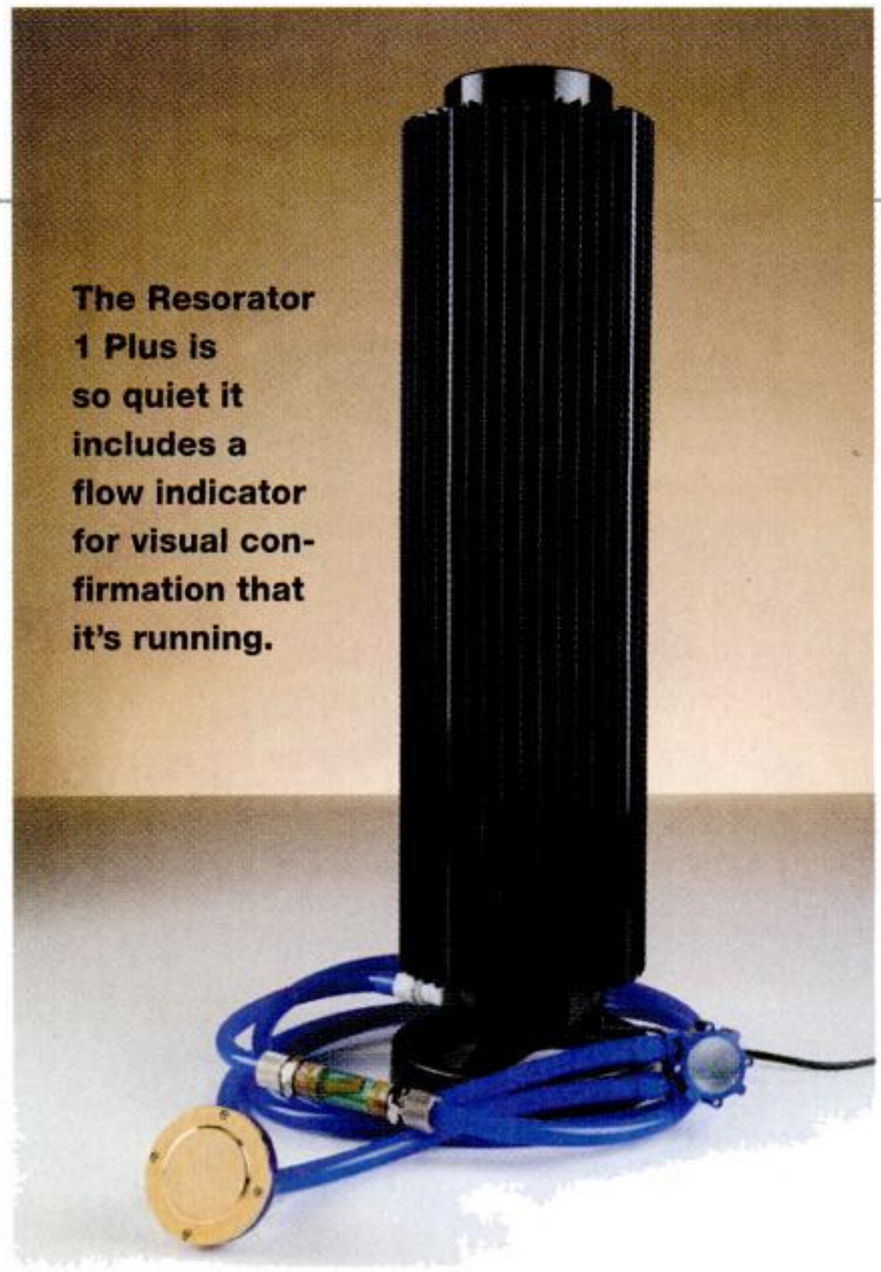
Zalman Resorator 1 Plus

CPU and VGA cooling without fans—yes way!



The Resorator 1 Plus is so quiet it includes a flow indicator for visual confirmation that it's running.

The Resorator's configuration is simple: a massive 24-inch tall aluminum combination reservoir/radiator (hence the product's moniker) that holds 2.5 liters of water. There's a small and silent 5-watt pump inside the radiator, strapped to the bottom of the tank. The 5/16-inch silicon tubing runs from the radiator tank to the CPU water block, then to the VGA block, and then back to the radiator. We love the auto-close valves on the reservoir. They let you disconnect the hoses for easy, spill-free travel. Trust us: This is an *extremely* convenient feature. Installation was, to borrow a phrase from the Pentagon, a cakewalk. Though motherboard removal is required for Socket 940/939/754 and LGA775 processors, instructions are clear and easy to follow. The installation process for the VGA water block was also a breeze and the explicit instructions prevented us from damaging our X800 XT test card.

Once fired up, the Resorator 1 Plus delivered cooling performance just a tad warmer than what we'd have achieved with stock air-cooling. It does this, however, without producing any noise whatsoever. In fact, the only way you can determine whether the Resorator is running is by glancing at its handy in-line flow-meter. That this cooler achieves decent temperatures while handling the load of both the CPU and an ultra-hot videocard at the same time is amazing to us. But the lack of a fan on the CPU socket does have drawbacks. The capacitors and voltage regulators on our LGA775 test platform became super hot without the aid of airflow around the processor area.

BENCHMARKS

	RESORATOR 1 PLUS	STOCK COOLER
AMD IDLE (C)	40	**36**
AMD LOAD (C)	53	**52**
INTEL IDLE (C)	46	**44**
INTEL LOAD (C)	**63**	**63**

Best temps are bolded. All temperatures were measured via the onboard sensors, using the utilities provided by the motherboard manufacturer. Idle temperatures were measured after 30 minutes of inactivity and full-load temps were achieved running CPU Burn-in for one hour.

Although the Reserator didn't perform as well as the Innovatek SET passive water-cooling kit reviewed last month, it was a lot easier to install, and goes one step further by including a VGA water block in addition to a CPU block. All in all, it's a hell of a product and a must-have if you're obsessed with making your PC deadly quiet.

—JOSH NOREM

ZALMAN RESORATOR 1 PLUS **9**

$245, www.zalmanusa.com

MAXIMUM PC KICKASS

Zalman CNPS9500 LED

A whole lot of flower power

Zalman's new cooler has begun its reign over the CPU air-cooling kingdom.

Zalman has been pimping its "blooming flower" heatsink design for what seems like ages, so we were understandably excited to see the company deviate from this mold with its all-new CNPS9500 LED CPU cooler. The cooler's unique design bucks conventional heatsink wisdom, but as the benchmarks show, it's still quite capable of accomplishing Zalman's twin goals: superb CPU cooling *and* quiet operation.

The 9500 sports standard air-cooling hardware, including a copper base, copper fins, and copper heat pipes, but it combines these ingredients in an entirely original way. Rather than using five or six short-length heat pipes that terminate in a dense array of big, long fins, the 9500 uses just three heat pipes, which start at the base and run in a figure-eight pattern from one side to the other, providing increased surface area for cooling and transferring heat to the copper fins. The fins are very small and their thin-blade design lets air from the 92mm adjustable-speed fan pass through without appreciable noise. The blue LED-lit fan is mounted on two floating posts, which helps reduce noise output.

BENCHMARKS

	ZALMAN 9500	STOCK COOLER
AMD FX-55 TEMPS		
IDLE		
FAN LOW (C)	35	NA
FAN HIGH (C)	**33**	40
100% LOAD		
FAN LOW (C)	49	NA
FAN HIGH (C)	**45**	54
INTEL LGA775 3.6GHZ		
IDLE		
FAN LOW (C)	37	NA
FAN HIGH (C)	**35**	44
100% LOAD		
FAN LOW (C)	51	NA
FAN HIGH (C)	**46**	63

Best temps are bolded. Idle temperatures were measured after 30 minutes of inactivity and full-load temps were achieved running CPU Burn-in for one hour.

Installation of the CNPS9500 is effortless. On AMD systems, you use the stock mounting bracket and simply tighten two screws. Intel LGA775 systems require motherboard removal and the installation of a Zalman back plate. The cooler comes with a fan-speed adjustment brick with an adhesive base for placement on your case or desktop.

During testing, the CNPS9500 delivered impressive cooling performance. What *is* surprising is how quiet the device is regardless of fan speed. Compared with the Cooler Master Hyper 6+ (reviewed in September), the CNPS9500's temperatures are virtually the same, and it's just as quiet. Zalman's cooler is also a cinch to install and looks enticing,making it worthy of a 10 verdict.

—JOSH NOREM

ZALMAN CNPS9500 LED **10**

$80, www.zalmanusa.com

MAXIMUM PC KICKASS

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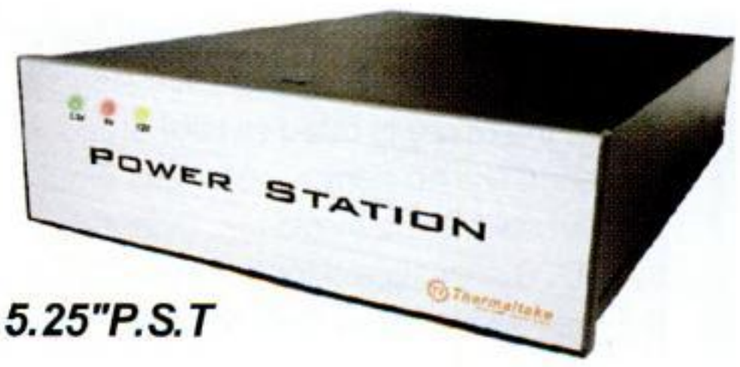

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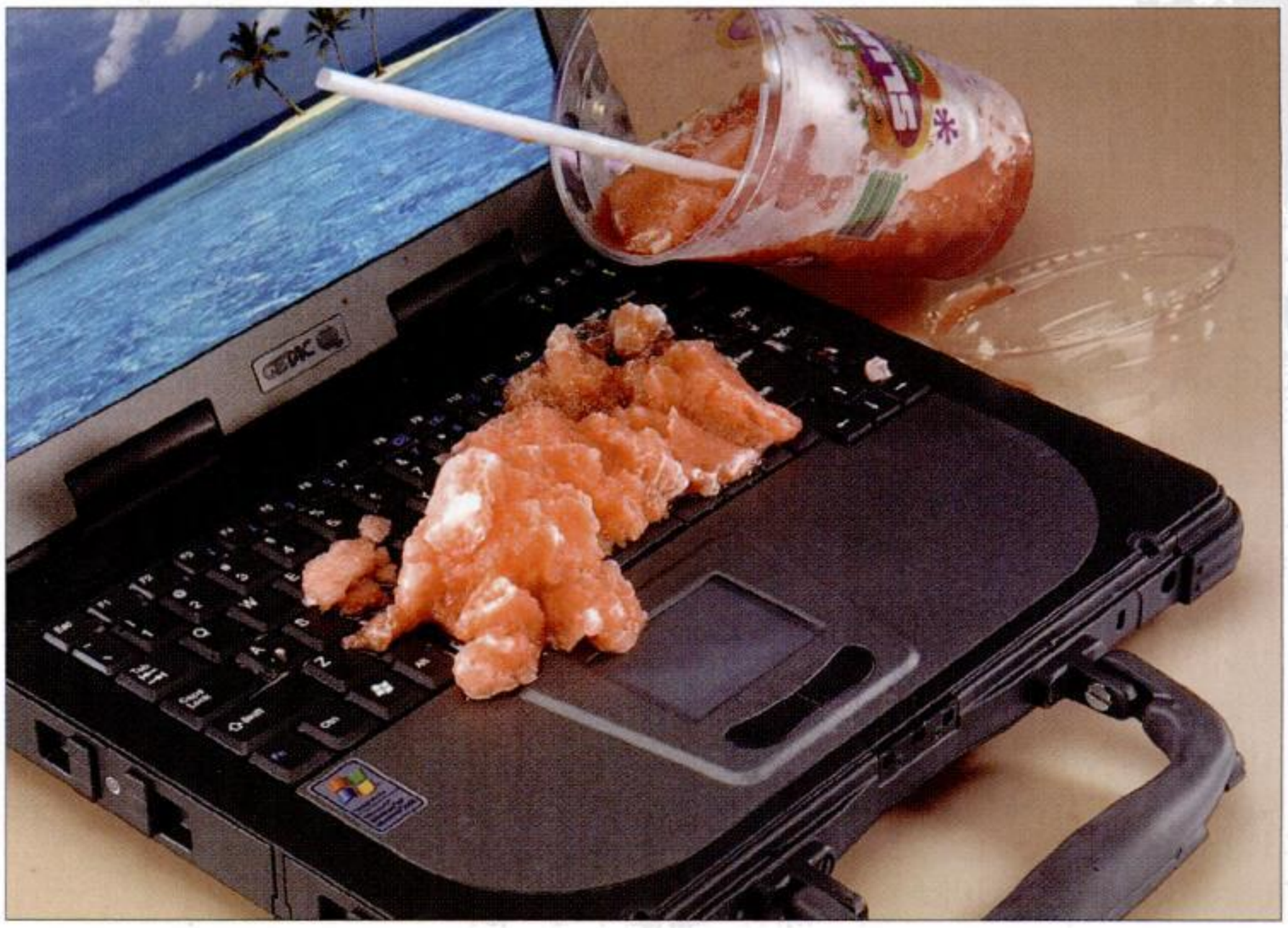
Getac M220

Built like a tank, the M220 gives you decent performance in a notebook you can't break



We dropped it, flipped it, froze it, and doused the M220 with an entire 7-11 Slurpee, without killing it.

There are two kinds of notebook geeks: the anal-retentive guy who keeps the plastic screen protector on his notebook at all times, and The Abuser. You know the type: The Abuser throws his unprotected notebook computer into a messenger bag and rides 10 miles over a dirt trail to work. Within a month, the lid looks like it tangled with a Brillo pad and the hinges are creaking.

It's The Abuser that the rugged Getac M220 will appeal to. Built to Mil-Spec standards, the M220 is rated to take drops, spills, and sand like no normal notebook would without splintering to pieces. Everything on the M220 is designed for survivability, from the magnesium-alloy shell that's about as thick as an Abrams tank's armor, down to the rubber seals over all the ports.

That's right, there are rubber seals over all the ports, sockets, and other crannies where water or some other unwelcome element could sneak into your rig. The M220 isn't completely waterproof, but it will take a good dousing of liquid if you happen to be computing too close to the surf on a beach, or in the vicinity of a water-balloon fight.

Whether checking your email or calling in an air strike, the Getac M220 is plenty tough.

Getac stuffed the M220's invincible shell with a low-voltage, 1.4GHz Pentium M 738, 1GB of DDR RAM, a 40GB hard drive, and an optical drive, all hooked up to the Intel 855 chipset. These aren't top-shelf parts, but Getac's explanation for not using more powerful components is sound, relating to the notebook's water and debris resistance: In order to keep the chassis sealed, Getac designed the M220 to be fanless—something you can't do with the hotter Pentium M models. We can forgive the 40GB HD as it can be upgraded to a 100GB model, but we simply can't forgive the pathetic optical drive. Our unit came with a CD-ROM drive! We didn't even know they *made* read-only CD drives anymore.

To judge the performance of the M220, we compared it with the Compaq NW8240 we reviewed in July. The M220's CPU runs about 30 percent slower than the Compaq, so the 33-to-37 percent slower scores in *Premiere Pro*, *Photoshop CS*, and Divx encoding were expected. In *3DMark03* we got an abysmally low score of 91, thanks to the integrated 855 graphics chip. Our standard DVD playback test wasn't applicable, as the M220 lacks a DVD drive.

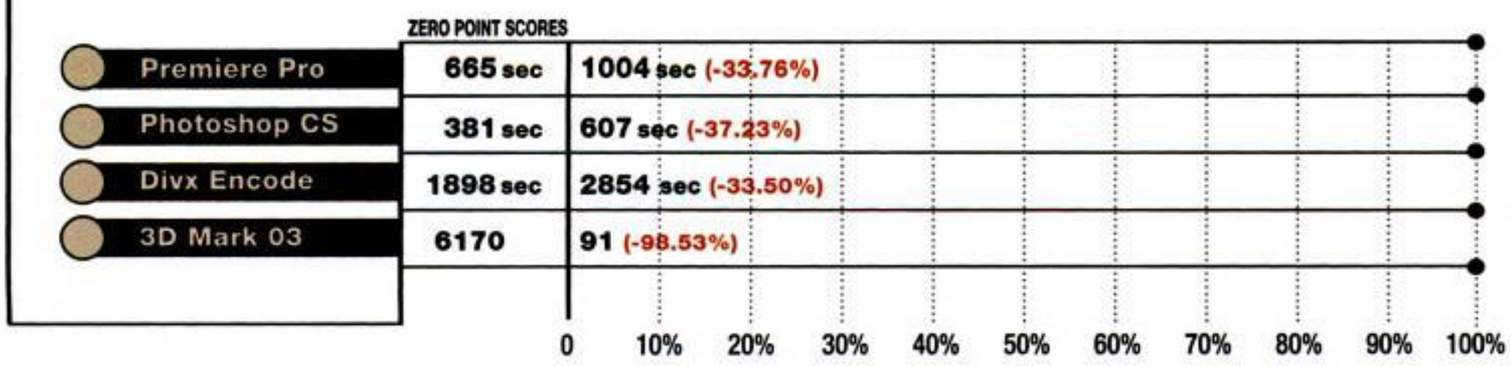
But do you really buy a notebook like this to play *Half-Life 2* out in the field? No, you buy a notebook like this so you can take it on an Africa safari to edit your digital images, without worrying about breaking the machine.

To test just how rugged the M220 is, we flipped it off a desktop onto a carpeted floor half a dozen times, sprayed it with liters of water, covered it with dirt, and froze it alongside our Hot Pockets. And in the ultimate Pepsi Syndrome meltdown we dumped a large cherry Slurpee on the M220 and washed it off with hot water. Did the notebook survive? Yup, and without a scratch.

Still, we were put off by a couple usability issues: The mouse buttons are particularly stiff and made our thumbs sore in one afternoon. The handle, while useful, is poorly placed—when the notebook is used on your lap, the handle either flips up and blocks access to the keys, or folds down, where it jabs you in the crotch. It's not a comfortable way to use a computer. Nevertheless, the M220 is one hell of a tough customer for people who are more interested in portable survivability than playing games or burning optical discs.

—GORDON MAH UNG

BENCHMARKS



Zero-point scores are derived from a 2.13GHz Pentium M Compaq NW8240, with an Intel 915GM/ICH6M chipset, 2GB DDR2/533 RAM, two 60GB 5,400rpm drives, and an ATI Mobility Radeon X800 256MB videocard.

GETAC M220

PREDATOR

You'll break from rough use before the M220 does.

ALIENS

Difficult mouse buttons, and the handle is poorly designed for lap use.

9

$3,995, www.getac.com

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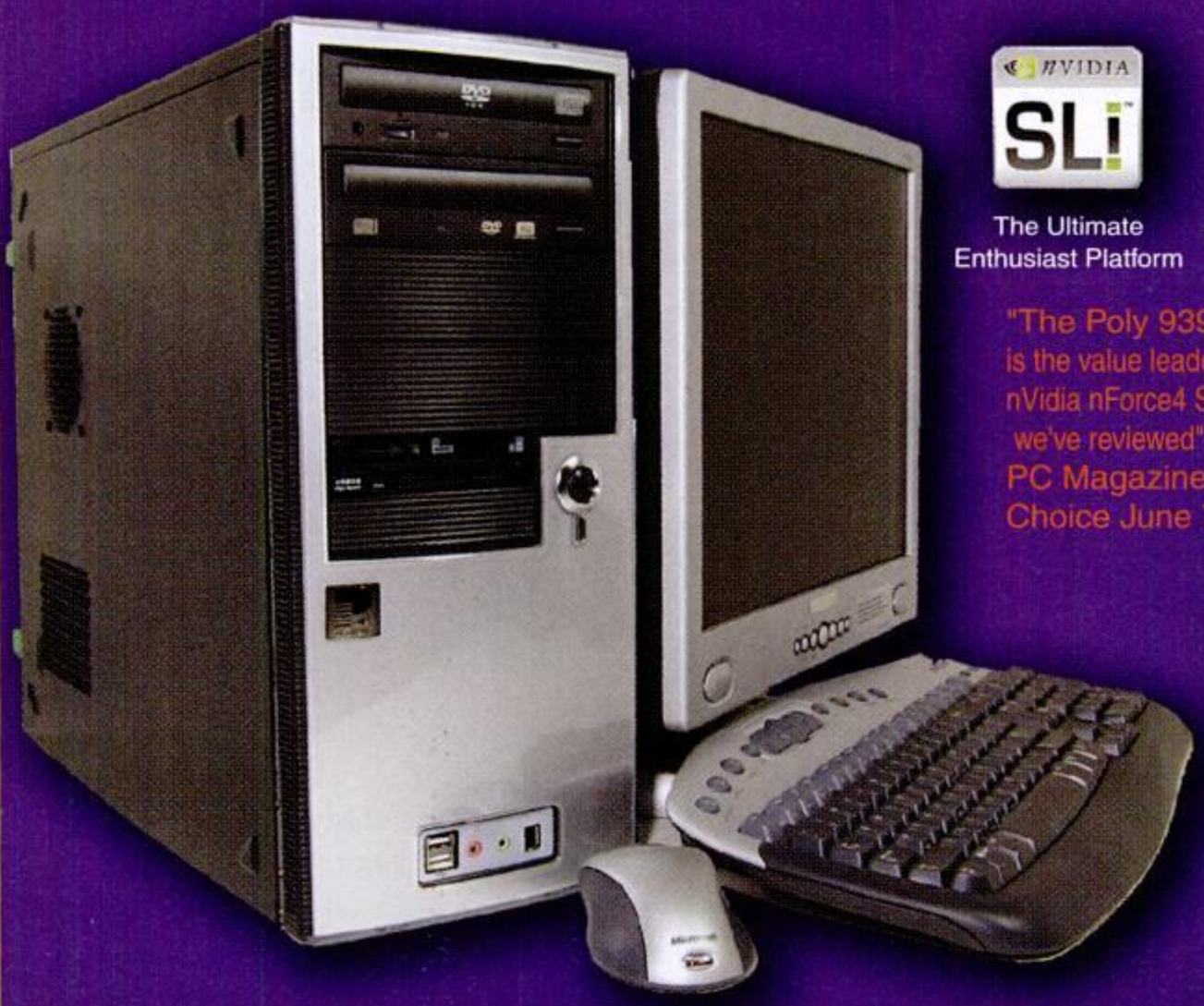

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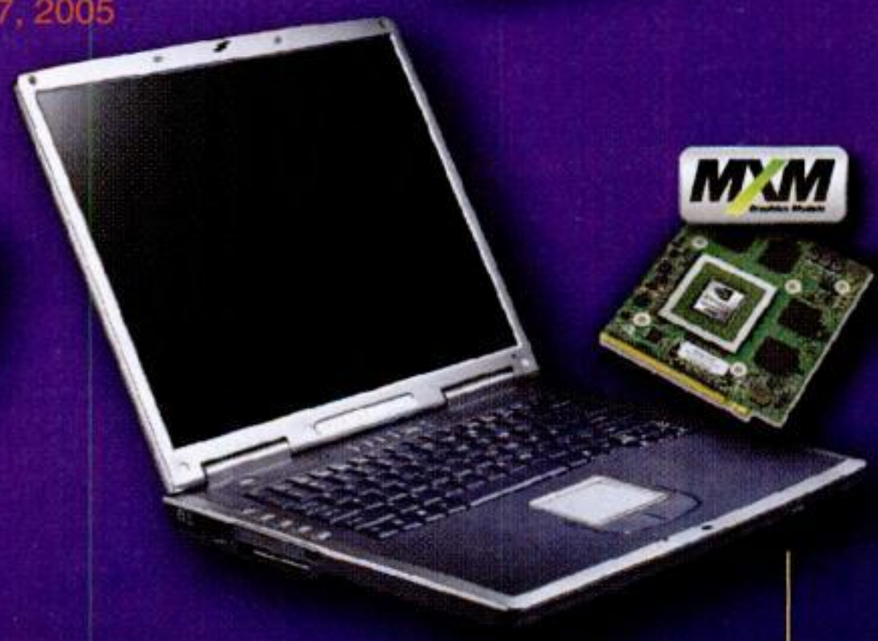

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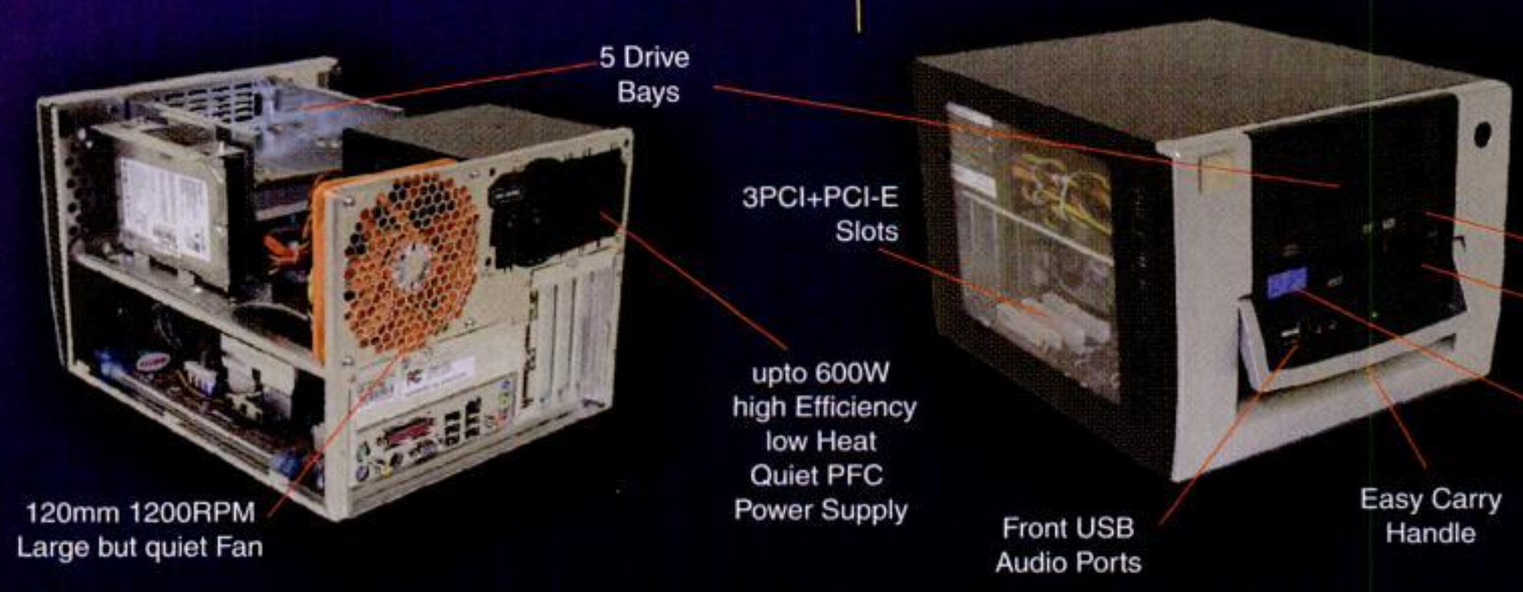

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WD Caviar SE 16 400

Actually, you *can* call it a comeback

Western Digital has been sitting on the sidelines of the hard drive technology race for the past year, quietly petting its Raptor, watching the competition ratchet up both capacity and buffer sizes to unheard of levels. And now that every one of its competitors has released a next-gen drive (Maxtor released its new drives more than a year ago, then Seagate, followed by Hitachi), WD has finally laid its cards on the table with its new SE 16 400GB drive. Granted, the drive's 7,200rpm spindle speed and 16MB cache seem kind of ho-hum these days, but its record-breaking benchmarks and surprisingly low price have made it our new favorite hard drive in the 7,200rpm category.

It's odd that Western Digital specifically referred to this drive as "next gen" when the company sent it to us for review, because nothing about the Caviar SE 16 400 fits that definition. For example, it boasts a last-gen SATA 150 interface, offers no support for SATA II features, and doesn't include native command queuing (NCQ). Western Digital says it's saving these features for its "RAID Edition" drives, which cost about $20 more. We don't mind, because such features are only useful in a multi-user environment; as the benchmarks show, this drive's "real world," single-user performance is incredible.

BENCHMARKS

HD TACH 3 RANDOM ACCESS TIME (MS)	13.1
HD TACH 3 BURST RATE (MB/S)	138
HD TACH 3 AVG. SEQUENTIAL READ (MB/S)	57
H2BENCHW APPLICATION INDEX*	29.7
DOOM 3 LOADING (SEC)	30
5GB READ (SEC)	101
IOMETER 50% RANDOM WORKLOAD (IO/SEC)	230
OPERATING TEMP WITH NO FAN**	45

**The application index is a real-world script of six applications. The score is based on the time it takes the drive to complete the scripts. **Hard drive temperatures measured using S.M.A.R.T. data, as reported by the Speedfan utility.*

Even without a SATA 3G interface and NCQ, the Caviar SE broke all of our benchmark records.

We pitted the Caviar SE against the current 7,200rpm champ—Hitachi's 7K500 Deskstar—and the WD drive beat it in nearly every benchmark, the lone exception was the NCQ-dependent file-server test. The Caviar's sequential read speed of 57MB/s is the fastest we've ever seen from a 7,200rpm drive, and its application-index score is also record-breaking. As a bonus, the Caviar ran a surprising 5 C cooler than the Deskstar at idle and was impressively quiet in operation.

This drive kicks all kinds of ass, and the fact that it costs about half as much as Hitachi's drive just seals the deal.

—JOSH NOREM

WD CAVIAR SE 16 400 — **9**

$275, www.wdc.com

MAXIMUM PC KICKASS

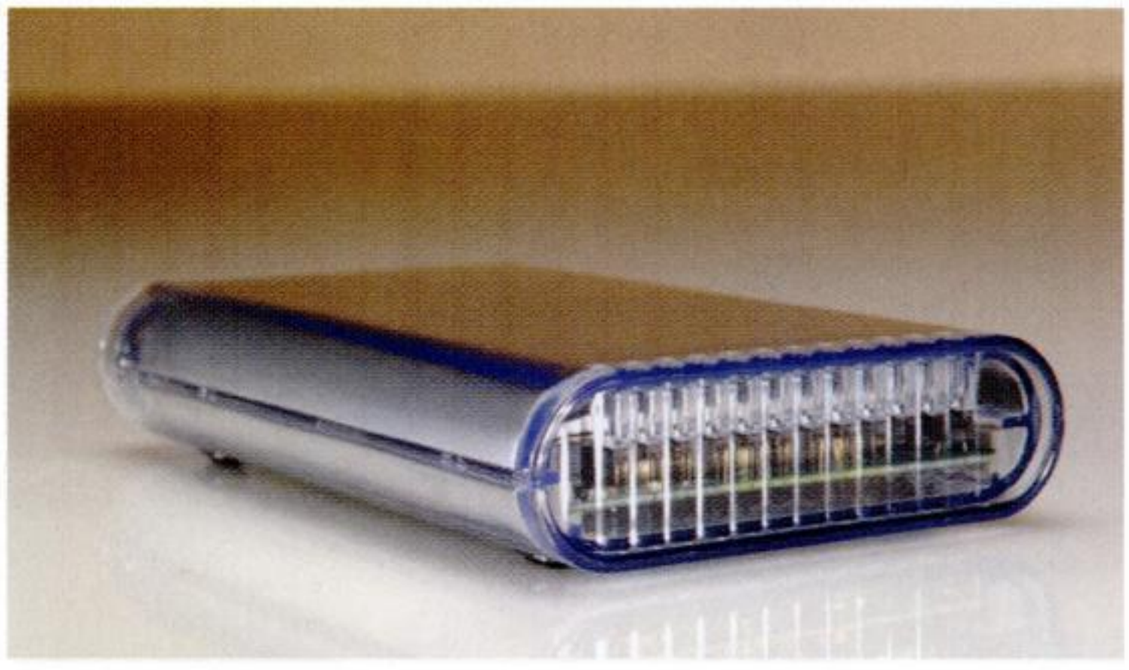
LaCie 40GB Silverscreen Hard Drive

Taking the show on the road—in style

With LaCie's Silverscreen you can take all those perfectly legal downloaded movies and DVD rips and play them wherever there's a television set—at home, in the car, or if you got caught illegally downloading, even in your cell. The Silverscreen hooks up to your TV through a scary-large proprietary cable with composite and S-video connectors (a component video cable is optional). A simple menu system allows you to select the type of media you want to play (it plays back photographs and music in addition to video) and presents you with the titles in a format that's easy to read and select from using the included remote.

In fact, what makes or breaks a drive like this isn't the number of formats it accepts, but how well it handles the number of ways in which movies can be encoded using these compression formats. And the Silverscreen plays more than any other portable video player (PVP) we've ever tested. Even Divx files encoded at very high bit rates played without a single hiccup. The device doesn't support Divx 6 compression yet, but this could easily be remedied with a firmware update.

The Silverscreen also cleverly solves a serious problem afflicting most portable video players. Because of "legal issues," most PVPs won't help you rip video to your hard drive, and compressing ripped DVD-Video files is user-hostile, time consuming, and prone to lost menus, subtitles, and other DVD features. While the Silverscreen won't play a commercial DVD if the files are simply dropped onto the drive, it will play an ISO, or disk image of the DVD, and treat



A portable video player with no screen? Could it be the Video iPod Shuffle we've been expecting?

it as a genuine DVD with all the features and resolution intact. So if you've got ripped DVD-Video files on your drive (sometimes they just, you know, *appear*), creating an ISO disc image of the files is a simple, two- or three-click affair in disc-mastering applications like *Nero* and *Easy Media Creator.*

As a data storage drive, the Silverscreen certainly won't be accused of doping to improve performance, taking 7:13 to transfer 7.5GB of data. But simply load it up while packing—you can't find a better way to watch your movies wherever there's a TV around.

—LOGAN DECKER

LACIE SILVERSCREEN — **9**

$220, www.lacie.com

MAXIMUM PC KICKASS

Copyrighted material

Steel Sound 5H USB

By pro gamers, for pro gamers—and wannabes!

Many a pro gamer or pro gamer wannabe wouldn't be caught dead at a LAN party without a Steelpad mousepad. Now, the company responsible for this fragging accessory is turning its attention to the headset market. Will the Steel Sound 5H USB headset raise your gaming abilities to "pro" levels? No—that part is still up to you. But it can help.

The headset is very lightweight, despite its somewhat bulky size. It's comfortable to wear for long periods of time, thanks to generous padding on the ears and connecting band. A retractable, flexible mic housed in the left ear cup performed flawlessly in our tests with *Battlefield 2* and *Counter-Strike Source*. And the included 7-foot extension cord makes it possible to use the headset with just about any conceivable PC setup. Oh, and the set can be easily disassembled for quick and safe packing—a great feature for gamers on *the go*.

The 5H's real claim to fame, though, is an onboard 3D audio DSP that makes the headset work much like an external USB-powered soundcard for notebook PCs. The included utility software can be used to tweak the DSP's equalizer settings for specific games, so you can more easily hear footsteps in *Counter-Strike*, for example, or the plop of a grenade in *BF2*. (Default settings are geared for *CS*, based on input from several pro players.) The onboard DSP and ability to save custom profiles for your favorite games means you'll get the exact same audio performance from any PC you plug the set into.

We love the Steel Sound's ability to produce subtle positional audio effects—such as with enemy footsteps in *Call of Duty*—but we would have liked to hear a bit more bass response; big explosions lacked some oomph. Still, for even the average Joe who wants a leg up on the competition, the 5H is a solid choice for an all-around gaming headset, albeit at a not-so-average price.

Every facet of the Steel Sound 5H's design is geared for gamers.

STEEL SOUND 5H USB **9**

$130, www.steelpad.com

—STEVE KLETT

Slim Devices Squeezebox 2

Not quite double the squeeze, but still Mr. Whipple-approved

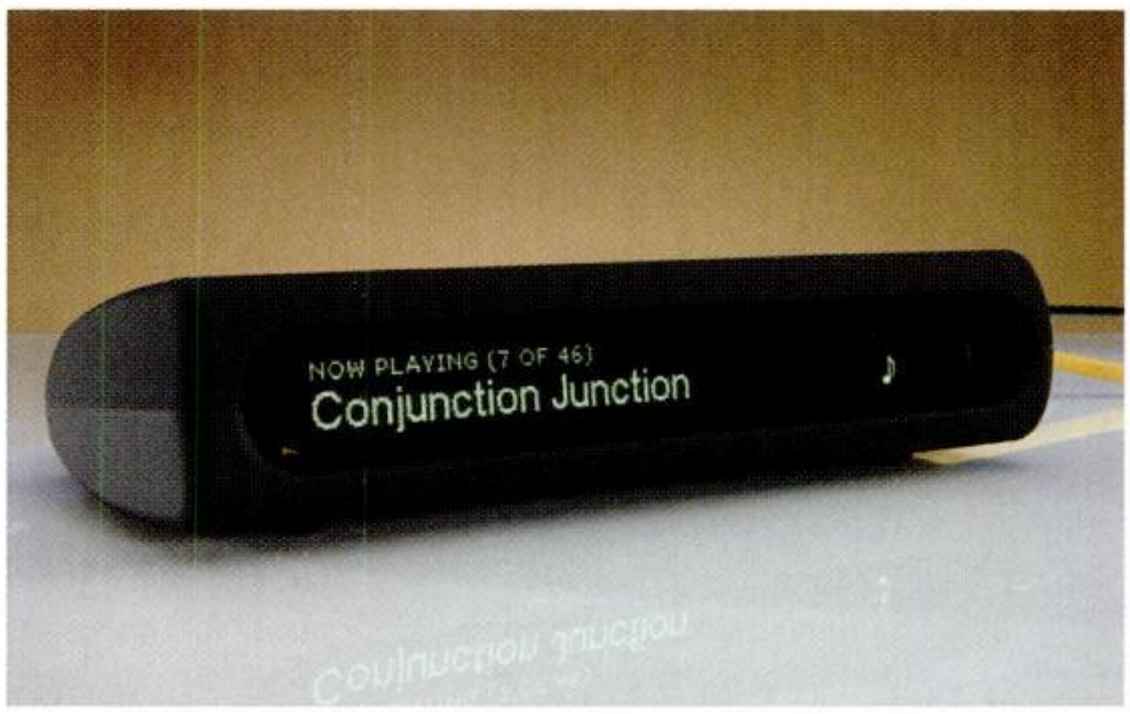
We all have the same problem: tons of music on our computer, but no way to listen to it in the living room. You need a streaming box! The folks at Slim Devices pioneered the category, and the original Squeezebox set the standard for wireless audio streaming. The follow-up Squeezebox 2 adds a few cosmetic upgrades and much-needed support for 802.11g.

The Squeezebox eschews an integrated amp (such as Sonos uses), instead offering a bevy of line-out options—RCA stereo, mini-headphone jack, and optical and coax SPDIFs. We don't miss the added expense of the amp, but we would love to see it as an option for bedrooms, kitchens, and other rooms without a stereo. Audio quality is excellent, whether using the SPDIF or analog outs, the latter of which use the integrated 24-bit DAC.

While the 802.11g Wi-Fi upgrade isn't technically necessary for music streaming—a very low-bandwidth task—it's a vital feature for an always-on device such as the Squeezebox. You see, if you connect an 802.11b device to an 802.11g network, the entire network slows to 802.11b speeds, which sucks.

Connect to the *Slim Server* software via PDA or laptop and you can control even a huge music library quickly and easily.

Our favorite new feature by far is the 320x32 vacuum fluorescent display. It's much brighter and easier to read than the earlier model, even from across a well-lit room. Still, it remains inferior to the display on Sonos' remote; but thanks to the magic of the open-source *SlimServer* software, you can get a close approximation with the Squeezebox, if you have an old PDA or laptop. Point a web browser at the server, and you'll get a handy remote interface.



The Squeezebox 2 will stream your tunes to every room in the house, and won't leave your wallet empty.

Even with upgrades, the Squeezebox 2 plays second-fiddle to Sonos' premium streaming system (reviewed in April), but the Squeezebox 2 is much cheaper ($200 for the wired version, $280 for wireless) and provides the same functionality and the same outstanding audio quality at a fraction of the price. It's a great option for budget-conscious music lovers.

SQUEEZEBOX 2 **9**

$280, www.slimdevices.com

MAXIMUM PC KICKASS

—WILL SMITH

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Earnest Burners

Sony and Lite-On throttle up their top-shelf burners

With the failure of the two competing next-gen DVD standards to merge into one consumer-friendly format, and what will no doubt be designer prices on the first drives and media, we're quite happy to see even modest speed increases in single- and double-layer DVD burning. In fact, if you've got a first-generation DVD burner, we think it's time to consider trading up to today's Nascar-level speed demons. Let's see how the latest from Sony and Lite-On pace in the great race to fill your disc space.

—LOGAN DECKER

Hot-looking, strong, and full of fire, Sony's DRU-810A is the Angelina Jolie of optical drives.

SONY DRU-810A

It seems someone at Sony decided to start kicking ass and taking names—the DRU-810A beat the crap out of several of our benchmarks and made a daring, if not entirely successful attempt to snatch the gold from Plextor's majestic PX-716A.

Writing 4.25GB of data to a single-layer DVD+R disc at 16x took 6:08 (min:sec), well behind the swift 5:50 turned in by Plextor's PX-716A. But the DRU-810A turns in its finest performance writing at 8x to both double-layer DVD+R and double-layer DVD-R discs; DVD+R DL clocked a stunning 15:45 to write 7.5GB of data, two and half minutes faster than the PX-716A.

DVD+RW speeds also got a hefty boost to 8x, knocking out 4.25GB of data in 7:56—at last, rewriteable DVDs have become a practical backup medium. And at a scant 2:50, you can burn a CD-R faster than you can print a label for it.

The DRU-810 supports bitsetting to increase compatibility with set-top players, overburning (a somewhat dangerous way of squeezing a few extra megs onto a disc), and overspeeding, which allows you to burn at speeds higher than the media is rated for, an option only available with specific types of media, listed in the documentation.

Plextor's PX-716A remains the power user's weapon of choice with its lower access times, broader range of overspeeding options, and the extremely powerful suite of utilities available in the bundled *Plextools* software. We're a little troubled over the DRU-810A's extremely high CPU utilization. But Sony's drive, which is bundled with the excellent *Nero* suite, breezes past the competition at double-layer disc burning, and would make even the snootiest rig proud.

SONY DRU-810A

VIENNA
Extremely fast burning to double-layer and DVD+RW discs.

VIENNA SAUSAGES
Few overspeeding options, and rather noisy.

9

$110, www.sonystyle.com

Stout, homely, but full of talent, Lite-On's SHW-1635S is more like Billy Bob Thornton than Angelina Jolie.

LITE-ON SHW-1635S

Optical drives from Lite-On may not always tear up the competition in the benchmarks, but they come pretty damn close, and at prices that make its burners a shoo-in for frugal folk. The SHW-1635S continues this admirably utilitarian tradition. It's rated for the same speeds as the DRU-810A above, but falls behind by a notch or two in most categories. Writing 4.25GB to a single-layer DVD+R was completed in 6:15 (min:sec), just behind the DRU-810A. Burning 7.5GB of data to a double-layer DVD+R took almost two minutes longer than Sony's drive, at 17:32. The SHW-1635S enjoyed a heady victory burning to 8x DVD+RW, however, at a satisfying 7:33.

Like the DRU-810A, Lite-On's drive supports bitsetting and overburning, but its overspeeding capabilities are scant, allowing us to burn a 2.4x double-layer disc at 4x, but not permitting us to exceed the write speed of a DVD+R rated for 8x. The drive comes bundled with the *Nero* disc-mastering suite, and the six-inch deep enclosure is ideal for small formfactor PCs. If access times had been kept below three digits, SHW-1635S would have merited applause and a higher verdict. Even so, only optical drive fanatics will suffer from the slightly behind-the-curve numbers—if you're really itching for speed, you could always put the money you save toward a really fast car.

LITE-ON SHW-1635S

OYSTERS
Plenty fast, if not top-notch; tidy six-inch enclosure.

ROCKY MOUNTAIN OYSTERS
High access times, slim overspeeding pickins.

8

$80, www.liteonit.com

BENCHMARKS

	CD		DVD	
	SONY	**LITE-ON**	**SONY**	**LITE-ON**
WRITE SPEED AVERAGE	29.32x	29.32x	11.20x	**11.89x**
READ SPEED AVERAGE	31.43x	**32.55x**	12.07x	**12.14x**
DVD-VIDEO EXTRACTION	n/a	n/a	**5:49 (min:sec)**	5:59 (min:sec)
ACCESS TIME (RANDOM/FULL)	**106/173ms**	111/202ms	**120/190ms**	120/198ms
CPU UTILIZATION	**6% (8x)**	10% (8x)	22% (2x)	**7% (2x)**

Best scores are bolded. The data CD burn test uses the bundled applications to create a 700MB CD-R. The single-layer data DVD burn test uses the bundled applications to create a 4.25GB disc. The dual-layer data DVD burn test uses the bundled applications to create an 8.3GB disc. The DVD-Video extraction test uses a 6GB commercially stamped DVD. All tests were performed using Verbatim media, except where noted.

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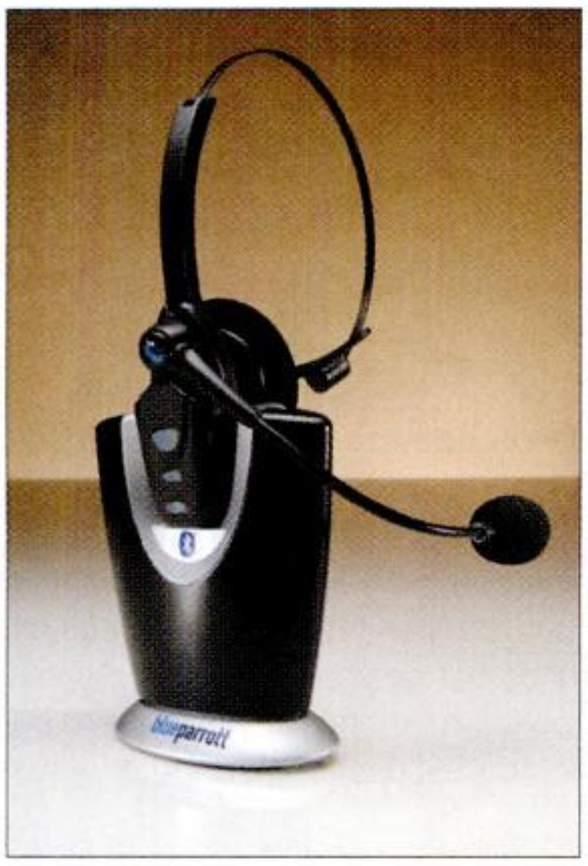
WIRELESS HEADSET



BlueParrott B100

We know Bluetooth technology is capable of producing good audio, because the Toshiba Bluetooth headphones we reviewed in October sound great. The audio quality of VXI's BlueParrott B100 headset, on the other hand, is on par with two cans and a length of string.

The headset can be used with either a conventional analog phone or paired with a Bluetooth cellphone. We tested the former configuration, hard-wiring the base station in-line to our phone. With its large earmuff, control module, and rechargeable battery hanging off the side of your head like a malignant tumor, the B100 is anything but inconspicuous. To receive a call, you simply touch a button on the side of the headset. Other buttons control volume and access services such as call waiting and conference calling. A stiff and finicky boom extends in front of your mouth.

VXI claims the B100 provides 75 feet of usable range, but audio quality at both ends of the line deteriorated rapidly when we moved away from the base station. The device was tolerable within a few feet, but at 20 feet, with two walls between the headset and base station, callers sounded as though they were gargling marbles.

—MICHAEL BROWN

BLUEPARROTT B100 **3**

$200, www.blueparrott.com

PORTABLE STORAGE

Memina Pocket Rocket 4GB

We used to think a 1GB USB key was embarrassingly decadent, but in these 4GB times we wouldn't even bother to pee on a 1-gigger if it were on fire. Sizes always increase, and as they do, consumers have to pay a premium for the top-capacity keys—this four-gig Pocket Rocket sells for a whopping five large. It's not really worth it, in our opinion.

This key offers nothing beyond its massive capacity. There's no encryption software nor is there a utility to make a hidden partition that can hold, say, a saucy video stash; in fact, there's no software whatsoever. These days we demand, at a bare minimum, some sort of utility that will protect our precious data in the event our thumb drive is misplaced or lost—after all, these suckers are small and can be hard to keep track of.

The good news is that the Pocket Rocket is very fast. It copied our 400MB test folder in a scant 45 seconds, which is a tick faster than the previous record-holder—Memorex's M-Flyer.

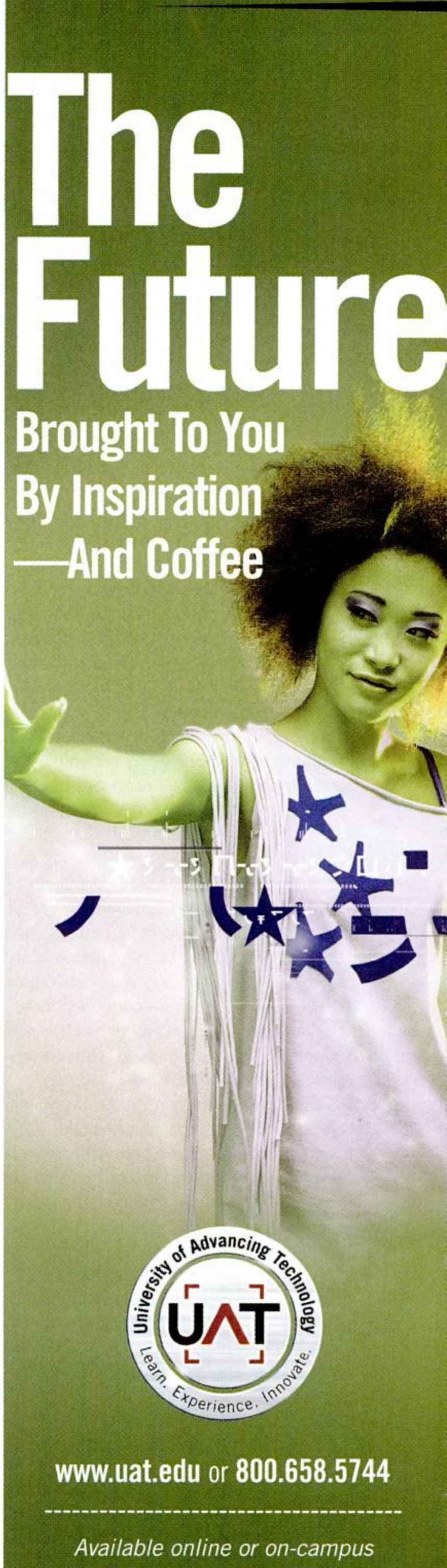
We like the flip-around cap, and the gold tip is a nice touch, but other than these small pieces of flair, the Rocket is a run-of-the-mill super-capacity key with nothing special to offer.

—JOSH NOREM

POCKET ROCKET **7**

$470, www.memina.com

The Future Brought To You By Inspiration —And Coffee



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Compact Camera Kerfuffle

Smaller bodies and higher resolutions do not equal poor image quality and less features

Casio's EX-S500 is the best all-around ultra-compact camera we've put through the mill yet.

Initially, in the compact and ultra-compact segments of the digicam market, more pixels crammed onto tiny image sensors generally equated to poor image quality—especially at ISO speeds above 200. But compression methods and image-processing technology have improved dramatically during the last year, as is reflected in the improved picture quality of today's smaller cameras.

Case in point: We lassoed four new cameras—two compacts and two ultra-compacts—from four industry stalwarts, and only one of them sucked. A year ago we'd have been happy with one winner out of four.

—STEVE KLETT

CASIO EX-S500

If slipping the ultra-compact, ultra-light, ultra-thin Exilim S500 Card Camera into your shirt pocket doesn't make you feel at least a little bit like 007 on vacation it's likely no camera ever will. Not only is the S500 sexy, it's also style conscious—coming in three color variations. Despite its diminutive size and weight, the camera feels quite durable, thanks to its stainless steel–clad body.

The S500 delivers in the performance category, too. Not only is it relatively speedy (power-up to first shot takes less than two seconds, and images can be shot sequentially in intervals of less than two seconds, as well), but pictures look very good across a wide range of conditions. Outdoor shots were nicely exposed and saturated, and indoor performance was excellent, even under moderate-to-low lighting conditions, thanks to the S500's very capable auto-focus and flash. Image noise crept into our pictures at 200 ISO, and even more so at 400 ISO—but not at unacceptable levels.

The S500 offers 29 preset "Best Shot" program modes, covering just about every conceivable shooting situation. And you can customize your own modes, too. While these presets make the camera very friendly to less-experienced shooters, it can be frustratingly slow to switch among them. The entire camera operation is controlled with buttons, which also makes fine-tuning the external 3x optical zoom a bit tricky.

You'll need to rely on the 2.2-inch LCD display for composition—there's no viewfinder. We didn't miss it, though, because the LCD works acceptably even in bright outdoor situations, and it brightens automatically in low-light conditions. Interestingly, while the camera boasts "anti-shake" technology, we noticed little difference between shots taken in low light with the feature on or off.

The camera also offers several movie modes, which will give you serviceable clips—though of quality far below DV cameras, which is to be expected. The Past Movie mode is noteworthy as it continuously stores images in its 8MB of onboard memory, so you can retrieve a clip beginning five seconds *before* you depressed record.

A super slim formfactor with superb performance, the S500 is tough to beat.

CASIO EX-S500

PIXEL-ICIOUS
Small, lightweight, durable; loads of features; good quality pics.

PIXEL-SICKISH
Menu modes are tough to navigate quickly; twitchy zoom controls.

9

$400, www.casio.com

NIKON COOLPIX S1

While its dimensions are almost identical to the S500, the Nikon S1's slightly thicker body makes it feel less like a "spy camera." This isn't a knock, certainly, as the S1 is still plenty small—you'll have no problem stashing it in your pocket or handbag.

The internal, very quiet, Zoom-Nikkor 3x optical lens produces very good overall image quality with nicely saturated colors in both indoor and outdoor shots, as well as balanced exposure. We did see a bit of barrel distortion in images shot at wide angle, and just like every compact camera we've tested, noise became noticeable at ISO 400. (Though, again, not at an alarming level for a camera in this category. And ISO 200 shots appeared slightly better than with the S500.) Like all the cameras in this roundup, the S1 has the traditional automatic exposure mode coupled with a variety of scenic modes to fit most any occasion. And it has an excellent macro mode—able to shoot subject matter as close as two inches to the lens.

In terms of raw shooting performance, the S1 is on par with the S500, with the added ability to shoot in continuous mode, which was very speedy for a camera of this size and delivered impressive results. One downer is that the LCD displays the last image captured, even in continuous mode, which can make it tricky to follow a moving subject. As is becoming common these

Nikon's CoolPix S1 is a great little camera, but its lens position can be problematic.

SPECS

	RESOLUTION	CCD	WEIGHT (WITHOUT BATTERY)	PRICE
EX-S500	5.25MP	1/2.5-INCH	4.06oz	$400
COOLPIX S1	5.1MP	1/2.5-inch	4.2oz	$380
POWERSHOT SD500	7.1MP	1/1.8-inch	6.0oz	$500
DSC-T7	5.1MP	1/2.5-inch	4.1oz	$500

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days, the S1 doesn't have a traditional viewfinder—it relies 100 percent on the 2.5-inch LCD. Fortunately, the LCD is quite serviceable for composition, even in bright sunlight and indoor conditions. (An auto-focus assist lamp helps in low-light situations.)

Unfortunately, the position of the internal zoom lens (upper-right corner of the body) makes it very easy for your finger or a shadow from your hand to make it into shots. Though with practice this should be less of an issue. All in all, the S1 is another solid choice for a general-purpose, compact camera.

NIKON COOLPIX S1

COOL CUCUMBER

Small, lightweight, durable construction. Speedy continuous shooting mode.

MELTED ICE CREAM

Too easy for your fingers to spoil a great shot.

8

$380, www.nikonusa.com

CANON POWERSHOT SD500

At six ounces, sans battery, it would be easy to label the SD500 as the SUV in this lot of sports cars. But that's not exactly a fair description as it also sports the highest resolution (7.1 megapixels), which makes it the only camera here with more than 1MP/oz performance.

This is little more than jargon if the camera's pics are so chock-full of noise that you wouldn't want to even throw them on the web, let alone make a 13x19 print. Amazingly, the camera turned out some of the nicest pics in the group, particularly at ISO speeds of 200 or below. At ISO 400, noise was more noticeable than with all the other cameras here, but still quite acceptable.

This is the only one of the four cameras here to sport a viewfinder, but its 2-inch LCD is a fine substitute. (A new version is due out soon with an even larger LCD.) It's the external 3x optical zoom lens that really sets this camera apart. Equivalent to a 37-111mm 35mm lens, this setup produces some of the most vibrant, well-saturated, and well-exposed shots of the bunch. This is due to the camera's bigger body, which holds a larger CCD, which helps keep the noise level down while delivering higher pixel-count pics. Like the S1, the SD500 has an excellent continuous shooting mode, able to take sequential shots at the camera's highest resolution setting at roughly half-second intervals.

Being slightly larger than other cameras in this roundup, the SD500 was the most pleasing to use. The dial control for the zoom allows greater precision with compositions, and there is more space in general between controls, which helps prevent accidental changes during camera operation. It also has the best movie mode of the bunch, producing serviceable 640x480 clips at 30fps.

Try as we might, we couldn't find anything to dislike about this camera, other than the price.

CANON POWERSHOT SD500

CORVETTE

Durable; intuitive controls; quality lens and pics.

PINTO

On the expensive side, and could use a larger LCD.

9

MAXIMUM PC KICKASS

$500, www.canon.com

SONY CYBER-SHOT DSC-T7

If the swimsuit contest held the most weight in this roundup, Sony's DSC-T7 would trump the competition—and soundly. This is of course not the case, and this camera's slick looks and overall design can't overcome its relatively mediocre image output or its high price.

Thin may be in, but the DSC-T7 is apparently too slim for its own good. Its internal 3x optical zoom lens and CCD combine to produce the least impressive shots of any of the cameras in this roundup. Noise was more apparent at ISO speeds of 200 and above, colors were not as saturated as we'd like, and scenes with bright lighting and shadows tended to be overexposed. The latter can be overcome at times by manually adjusting such things as white balance and flash power. But from a pure point-and-shoot perspective, the DSC-T7 is not the best choice for budding photographers. Even with tweaking, the output was still not as nice—or as high-resolution—as what you'll get from the SD500 for the same cost.

Still, the DSC-T7 is one very slim, very cool-looking camera. To boot, it's a speedy performer, for the most part, and sports a beautiful 2.5-inch LCD (of course, the spiffy LCD comes at a price: You get only about 40 minutes of use out of the camera for each battery charge). You can power it on and start shooting in less than two seconds, and shot-to-shot times were excellent too, averaging less than two seconds even with flash. Unfortunately, the zoom is one of the slowest we've seen, the button to control it is ridiculously small, and making precise adjustments is tough.

In general, the controls are well-spaced and easy to use; however, the camera suffers even more than the S1 as regards the placement of its internal zoom lens in the extreme upper-right-hand corner of the body. This position makes it far too easy for your hands to disrupt a shot.

With better-performing, less-expensive options out there, it's tough to recommend this one.

SONY CYBER-SHOT DSC-17

BEAUTY

Slick, durable design. Large, vibrant LCD.

BEAST

Slow lens, average image quality, and expensive.

5

$500, www.sony.com

The Canon PowerShot SD500 feels very sturdy in your hands, and it's a solid performer, to boot.

When it comes to "wow" appeal, the Sony DSC-T7 has few peers.

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Who Makes the Mightiest Mouse?

Logitech's lovely laser faces off against Apple's two-button Mighty Mouse

Picking the perfect mouse is an intensely personal chore. It's a lot like shopping for underwear: You frequently need to try on every pair in the store before you find the ones that fit just right. We're pretty certain that a lot of you are going to think one of these mice is just right, and that while the other looks good, something is definitely missing.

—WILL SMITH

APPLE MIGHTY MOUSE

It's shocking but true: Apple has finally shipped a two-button mouse. Unfortunately, the company's first foray into bi-button rodentia can only be considered a flop.

Apple's Mighty Mouse ain't much of a mouse. Its touch-sensitive buttons are easily confused; if you push down on both sides of the mouse at once, unpredictable things can happen.

APPLE MIGHTY MOUSE

+ MIGHTY MOUSE (cartoon)
Looks good; useful scroll ball; touch-sensitive buttons.

− MIGHTY MOUSE (mouse)
Buttons are too touch sensitive. Scroll ball is too small. Cord is too short.

4

$50, www.apple.com

The problem lies in the way the "buttons" work. You see, there aren't multiple buttons on top of the mouse, but multiple touch-sensitive areas. Rest your finger to the left of the scroll ball (more on that in a moment), push down on the mouse, and you've left-clicked. Rest your finger to the right of the scroll ball, and push down on the mouse, and you've right-clicked. Rest your finger on both sides at once, and the results are unpredictable.

This is a problem particularly when you need to click and drag over a large area. Because the button only stays depressed while you're pushing down on the entire mouse, as soon as you lift the mouse to reposition it in the center of your mousepad, you stop clicking! Imagine the frustration of trying to drag across large photos or circle strafe in a deathmatch.

That said, we really like the scroll ball. It's infinitely more functional than the standard tilting scroll wheel, and would be perfect if it were slightly larger. Sadly, the Mighty Mouse's fancy ball can't save it from some serious design flaws. When you factor in a cord that's too short and a steep price, you'll realize you can do a lot better in a mouse.

LOGITECH G5

The original laser mouse—the wireless MX1000—is still one of our all-time favorite mice. And this one's even better. It uses the same laser sensor as the MX1000, but integrates the on-the-fly, driverless sensitivity shifting that first appeared on the MX518 earlier this year. That's just sassy.

It's difficult to describe how incredibly smooth the G5's action is. When used with a Teflon-coated mousepad, it's the nearest thing to frictionless you'll find this side of Dupont. The mouse glides effortlessly across the surface, tracking with pixel-perfect precision. Its surface is slightly textured for easy grip, and all six buttons are well placed for in-game action. We especially like that Logitech grouped the sensitivity buttons below the scroll wheel, instead of placing one above and one below.

We dig the tilting scroll wheel—although

The Logitech G5 has it all: high-resolution laser sensor, on-the-fly sensitivity control, and adjustable weights (shown below), to customize its ride.

LOGITECH G5

+ LIFTING WEIGHTS
Sensitivity-shifting sensor, weighted design, and nifty woven cable.

− GAINING WEIGHT
Where's the second thumb button?

9

MAXIMUM PC KICKASS

$70, www.logitech.com

we still haven't found a game that really uses the feature—and we *love* the sensitivity setting display. The three-bar display lets you know whether you have the mouse set to über-fast or molasses-slow. That's pretty neat, in a whiz-bang kinda way, but our favorite feature is the weight compartment on the mouse's underside. With 16 included weights, and room for eight in the mouse's weight tray, you can add weight to emulate the satisfying heft that the batteries in a wireless mouse deliver. That we like.

Our only complaint is that Logitech removed the second thumb button, something we find eminently useful for push-to-talk and other secondary features. But we're willing to forgive this one tiny flaw on an otherwise spectacular product.

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MP3 Evolutions

Three new players experiment with form and function

Everyone's got an MP3 player these days, so it comes as no surprise that we're seeing players with unusual angles meant to capture the attention of hold-outs, Luddites, and novelty-seekers. *Maximum PC* investigates the season's newest crop.

—LOGAN DECKER

PHILIPS 256MB SHOGBOX

We blushed when we received the Philip's ShogBox, a rather, um, suggestive name for a portable alarm clock with built-in speakers that plays MP3s. Waking you with a buzzer, FM radio, or your own imported music, it's the perfect accessory for traveling the world in search of a better MP3-playing alarm clock.

The Philips ShogBox—don't leave home *with* it.

Where to begin? You can't use the FM tuner without the included antenna, as if you're going to remember to bring *that* when you're packing. A travel alarm clock should certainly have an FM scanning function, which the ShogBox does not—you can't even manually wander the FM band. There's a line-in jack for listening to another player through the ShogBox's speakers, but doing so disables the alarm, so you'll have to remember to remove the line-in source before you doze.

The sound is brawnier than you'd expect from a cucumber-size gadget, but severe distortion creeps in above 75 percent volume. You must use *MusicMatch Jukebox* to load the ShogBox with MP3 or WMA tracks (including protected WMA), and transfers are limited to USB 1.1 speeds. Good grief.

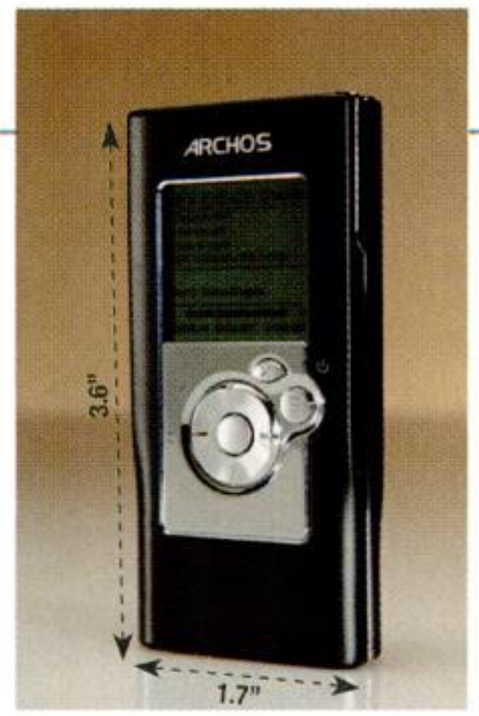
The ShogBox can play protected WMA files and exceeded Philips' rated battery life at slightly more than 12 hours at 75 percent volume, but as is, we'd still rather not get Shogged.

MOBIBLU 1GB DAH 500I

Mobiblu's DAH-1500i is smaller than a single cubic inch and has the crisp OLED display the iPod Shuffle forgot to include. But the diminutive size and design are more of a hindrance than a convenience, unless you're a complete sucker for novelty.

Like a jellyfish, the DAH-1500i uses a single orifice to perform all necessary functions—transferring tracks, charging, and connecting headphones. That's nice, but the bundled earbuds' cable is only long enough if you're wearing the player around your neck (and looking like a tool in the process). Swapped out with your own earbuds, the square form feels weird in your pocket and is difficult to operate without looking at the controls. The sound is acceptable for exercising and whatnot, with

A couple DAH-1500is would make a fabulous pair of earrings for a drag queen.



The most we can say about the sound quality of the Gmini XS 100 is that it's far superior to AM transmission and HAM radio.

particularly deep bass, but not exceptional otherwise. Battery life earns a shrug at a little more than eight hours at 75 percent volume.

We appreciate that you load the DAH-1500i using Windows Explorer or *Windows Media Player*, that it supports directory structures, plays WMA and protected WMA tracks, and includes a custom five-band EQ facility. It's no loser, especially for the price, but we can't recommend it unless you require a gimmick to initiate conversations.

ARCHOS 3GB GMINI XS 100

We, like, totally dig Archos for its many fabulous products, but the hard drive-based Gmini XS 100 isn't one of them. Despite its charming simplicity, it seems dowdy and overpriced compared with the extraordinary 4GB iPod Mini and Creative's 4GB featurific Zen Micro, which both cost just $30 more.

The defining element is, of course, the sound, and the Gmini XS 100 sadly fails to distinguish itself in this category, whether playing MP3, WMA (including protected WMA), or shiny, uncompressed WAV tracks. The bundled earbuds, not surprisingly, deliver dry and lifeless audio, but even paired with Shure's E4c earbuds the sound quality falls well below that of the iPod Mini and Creative's phalanx of players, thanks to the grainy highs. Conditions do not improve with the EQ presets, and the Gmini XS 100 has the least effective five-band custom EQ we've ever heard. We got off on the seven-line screen that displays the current track title as well as the next track in the queue, but that's not enough to compensate for flimsy audio.

PHILIPS 256MB SHOGBOX

3

YAKS
It might beat the alarm clock in your hotel room.

TAX
And then again, it might not.

$130, www.philips.com

MOBIBLU 1GB DAH 1500I

6

CATS
A surprising number of features, including a very sharp display.

GNATS
Controls are way too small for comfort; blah sound.

$130, www.mobibluamerica.com

ARCHOS 3GB GMINI XS 100

4

BEAVERS
Nice display; plays uncompressed WAV tracks.

FEVERS
Sound quality far behind its peers.

$170, www.archos.com

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Quake 4

For better or worse, Q4 stays true to its roots

If someone were to put together a gaming time capsule and bury it for future generations to find, we'd definitely recommend it hold a copy of *Quake 4*. The game plays like a greatest hits of the last decade, regurgitating practically every "exciting new feature" we've seen in single-player first-person shooters over the past few years, while also recycling the definitive deathmatch title—*Quake III*. Though several recent FPS games have moved the goalposts, with new innovations and different takes on the FPS experience, *Quake 4* lacks such freshness. Instead, it's an action-packed, but very straightforward, and even derivative shooter that still manages to be fairly entertaining at times.

The story is unimportant, and you'll be hard-pressed to recall what you were fighting for the second the credits roll, but the gist is that you are a space marine and you have to take down the Strogg—the evil race of human/machine hybrids from *Quake 2* who are bent on galactic domination. Gameplay is FPS 101: You'll stroll through corridors shooting everything that moves.

***Quake 4* borrows heavily from the innovations of its FPS predecessors—we saw this shield in *Halo*—but the action is fast and furious.**

The deathmatch isn't like *Quake III*—it is *Quake III*, and includes two of that game's maps, including the ever-popular space map DM17.

There are a few vehicles to mix things up, along with a handful of simple puzzles, but the meat of the game is the shooting, and there's lots of it, including several very well done, epic multi-stage boss fights.

We wondered if playing as a Strogg—the most heavily marketed aspect of the game—would be the secret sauce we so longed for. Sadly, it's not. Your weapons as a Strogg are exactly the same, and you're still part of your Marine squad. In fact, being a Strogg is no different from not being a Strogg, with one small exception: You can read signs written in Stroggese on elevators and doors. This ability allows you, as a Strogg, to wander alone for certain key segments of the game's surprisingly short eight-to-10 hour single-player campaign.

The good news is that the action is nonstop from the get-go. The fighting gets frantic towards the end of the game, where the AI ratchets up to "good" levels (as opposed to the "cannon fodder" simplicity in the early parts of the game), and you are swarmed by multiple enemies. Your squad mates' AI kicks ass. They never get in your way, but they know how to follow properly, and they do what they're supposed to at all times without being stupid or pissing you off.

Graphics are excellent, but the game bears more than a passing resemblance to *Doom 3*. *Quake 4* boasts several large, albeit barren, outdoor environments. Luckily these areas pass by quickly, because you're usually traversing them in a vehicle (possibly a too-slow mech or a peppy, entertaining hover tank).

Multiplayer is surprisingly fun. Straight-up twichfest deathmatch aficionados will love it, as it seems to be ported directly from *Quake III*. There are even two *Q3* maps that have been redone, and the most popular *Quake 2* map—the Edge—is included as well. Some of the maps include powerups, such as haste and regeneration, but the only game modes are DM and CTF. Though it's exactly like *Quake III*—which we already played years ago—we can't deny it's fun.

Most people will finish *Quake 4's* single-player campaign in a few hours and never pick it up again, but the multiplayer component could conceivably revive the long-dead *Quake* deathmatch scene. Despite a dearth of innovation, *Quake 4* stays true to the series' roots and delivers what people expect from a *Quake* game—lots of action and killer multiplayer.

QUAKE 4

+ BFG
Tons of action, excellent graphics, and awesome deathmatch.

− LFG
Derivative gameplay, and short single-player component.

8

$50, http://quake4.ravengames.com, ESRB: M

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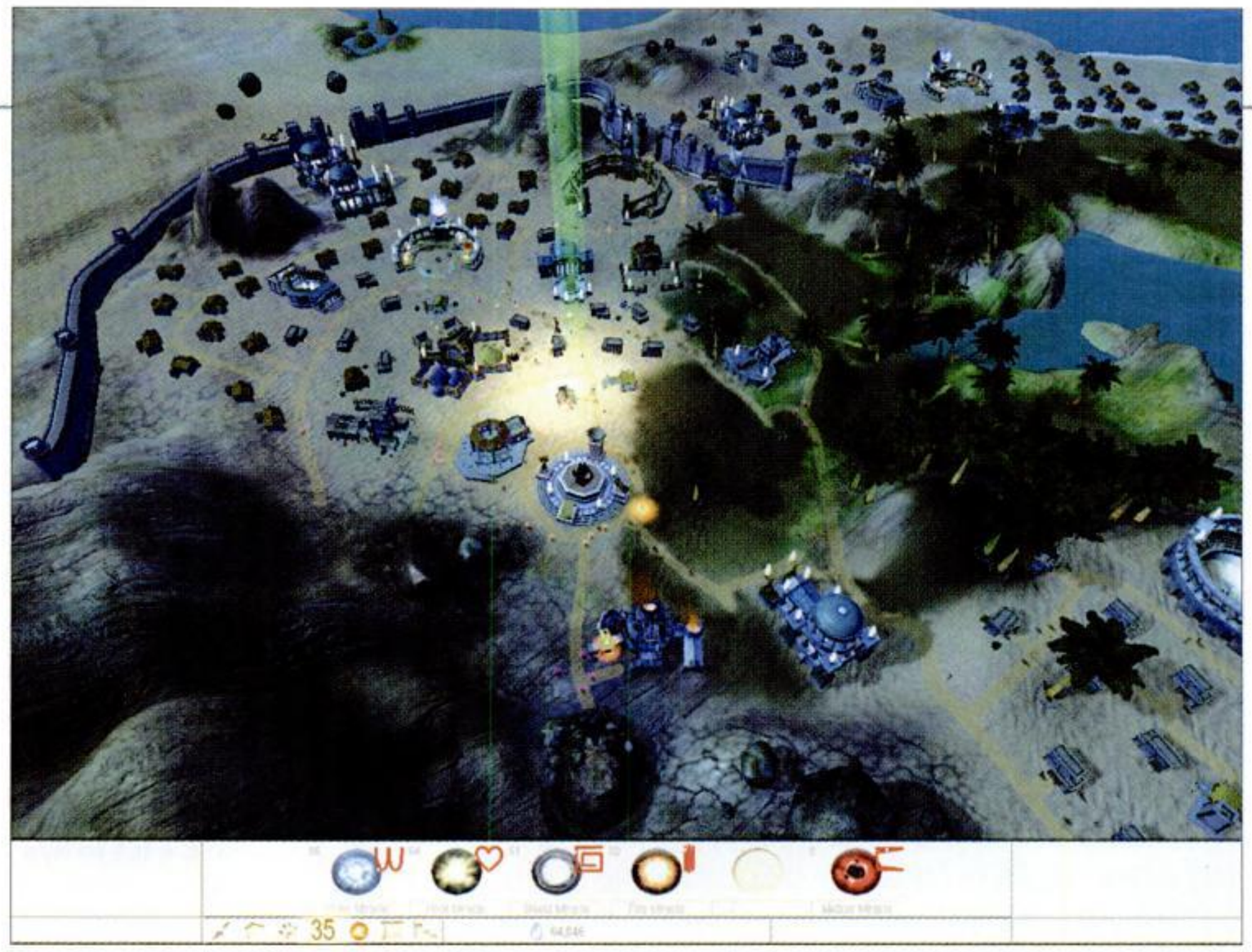
Black & White 2

It's a little bit god game, it's a little bit RTS



Build an amazing city, take over the world. It's really that simple in *Black & White 2.*

The original *Black & White* was, in many ways, a failed experiment in emergent game design. It attempted to meld god games—where you build a city to help your people grow and flourish—with the pet management games that were all the rage in Japan. You could, theoretically, teach your pet to do all sorts of nifty things—help build your city, harvest resources, turn the enemy into paste. The way you treated your creature and worshippers affected everything about the game. Benevolent players' lands were filled with light and happiness, while evil players' lands were dark, unpleasant places.

Unfortunately, bad controls made the most basic tasks in the game challenging, and the creatures were difficult to train. Worse, the win conditions for each map were unclear, making the game completely inaccessible for all but the hardcore. The game wasn't a train wreck, but it was more frustrating than fun.

Black & White 2 is everything the first game should have been. The god game and the pet are still there, but the folks at Lionhead also added a real-time strategy element, giving both good and evil victory conditions for each mission.

Building your city is simple enough. Place buildings using a menu system and your people take care of construction. Place fields and your people gather the crops. While you can dedicate individuals to specific tasks (building, gathering, mining, and—ahem—breeding), it's not necessary. Your people will automatically do everything they can to keep your city running smoothly. This alleviates most of the micromanagement pain common to god games, and in turn lets you focus on more important tasks, like turning your enemies into paste. When your city becomes impressive enough, villagers from other towns and cities will abandon their homes to live with you.

When properly trained, your creature will act as your proxy, healing your people and crushing your foes.

If you're more interested in raining death and destruction upon your enemies, you'll need to build a war machine. Unlike traditional RTS games, where you have dozens of different types of units to manage, *B&W2* gives you three: infantry, archers, and siege weapons. The simplified approach eliminates much of the "I use these little guys against cavalry, except for these guys, who are immune" nonsense. Instead, you have to use all your units carefully, support them with your creature, and know when to call for a retreat. To win with an army, you'll need to conquer each of the other faction's cities, one at a time.

Training your creature is easier in this *B&W* sequel. When he pleases you, praise him. When he disappoints you, punish him. If he's doing something you don't like—say, eating the villagers—but you can't catch him at it, there's even a handy interface that lets you deliver time-delayed praise or punishment. Eventually, he'll become an independent extension of your will, smiting your enemies and embracing your friends.

The game follows the basic rules of any world. Water something and it will grow. Light it on fire and it will burn. Exercise and you'll get stronger. Eat too much and you'll get fat. In addition to manipulating the physical world, you and your creature can perform miracles, spraying water, fire, or healing rays throughout your city. The real magic happens when you combine these abilities. If you want to see your enemies faces light up, try chucking a burning tree at them. Well, it makes us smile at least.

—WILL SMITH

When you tire of being good, you can unleash all sorts of unpleasantness on your opponents. Nothing sends a message like a meteor shower.

BLACK & WHITE 2

ZEUS

Playing god is great fun. Fire, brimstone, and a wrathful creature are all at hand

JUPITER

Controls can be a little wonky. No locusts.

9

MAXIMUM PC KICKASS

$50, www.ea.com, ESRB: M

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Fable: The Lost Chapters

Better than it was on the Xbox, but still lacking

Fable: The Lost Chapters is far too linear and short (about 14 hours) to be labeled a "must-have," particularly on the PC. However, on this platform it's infinitely more pleasing to look at (thanks to the higher resolutions) and easier to play (thanks to the keyboard and mouse) than it was on the Xbox.

You begin as a small boy whose family is murdered by bandits. You're taken in by the local Heroes Guild, where you learn all the basic skills of being a hero (melee fighting, ranged attacks, magic, and combat skills). Then, you set out to avenge your family. As with most of Peter Molyneux's games, your choices have good or evil consequences, and the populace will react to you according to your deeds. Your visage also changes to reflect your alignment.

"The Lost Chapters" portion of the title refers to content that was axed from last year's Xbox-only version but is included here. This extra content is literally tacked onto the end of the game and offers a new snowy region to explore, a few extra enemies to slay, and another ending steeped in cliché. The transition between the original ending and new story content is rough and vague. We also experienced a bug with a significant side quest, and the game suffers from some audio issues, as well.

Thankfully, there are plenty of new items, spells, and side quests to discover that add greatly to *Fable's* replay value. These righteous bonuses make the game's flaws (and brevity) a bit more forgivable.

There's a lot to like in *Fable*, especially the arena combat.

You'll encounter plenty of mini-games traveling from town to town, so be prepared to go fishing, hunting for treasure, and chicken-kicking. You can even chat up the local barmaids and try to get a little "hot grog" from them, in a purely-PG fashion. Cheeky humor is a big part of the game's allure, and in our opinion it adds a lot of heart to a title that might otherwise be easily passed over.

THE LOST CHAPTERS — **7**

$50, www.fable-game.com, ESRB: M

—STEVE KLETT

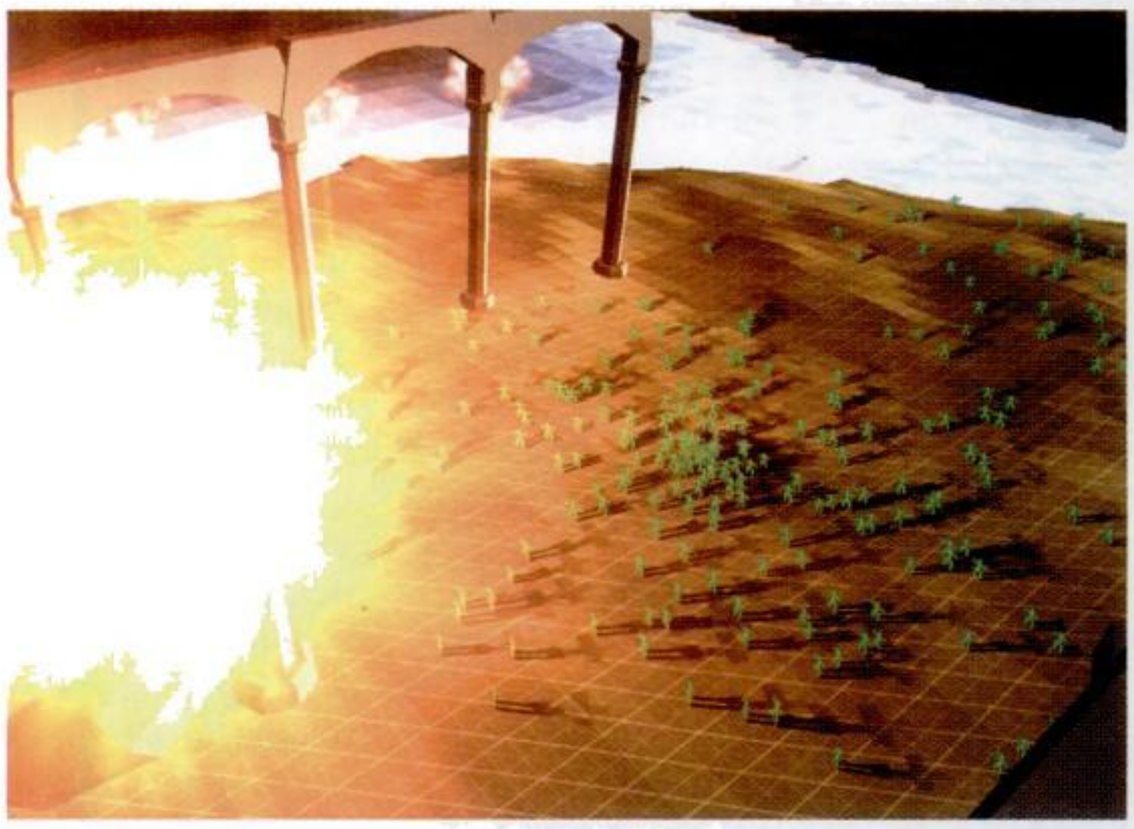
Darwinia

Don't let the 2D sprites scare you away

Stuck with a vast inventory of computers he couldn't sell, alpha geek Dr. Sepulveda links the machines together to create a "virtual theme park" called *Darwinia,* inhabited by 2D sprites with primitive artificial intelligence. Over the next 20 years, the Darwinians evolve into beings that socialize, reproduce, and even develop their own culture; they are by many definitions alive. But the peaceful Darwinians lack the skills to defend themselves, so when a nasty virus infiltrates the system, indiscriminately destroying or subjugating everything in its path, it appears that the inhabitants of Dr. Sepulveda's little science project will soon be very much dead.

Although it's never explained who "you" are, Dr. Sepulveda is mighty grateful for your serendipitous appearance, and throughout the game he provides you with strategic advice and programs he developed to defend the Darwinians and cleanse the system of its intruders. At its heart, *Darwinia* is a real-time strategy game, pitting you against snaking viruses, bite-first-ask-questions-later ant colonies, and a hellish bestiary of accomplices while you attempt to win back control of the polygonal archipelagos that make up *Darwinia's* 10 levels. Yes, it's an RTS, but it's been swept clean of complicated interfaces, mining grunt work, and bureaucracy; instead, pressing the Tab button brings up the Task Manager, where mouse gestures launch Dr. Sepulveda's various subroutines.

Despite, or perhaps because of, *Darwinia's* minimalist graphics, the game delivers intensely exalting moments: the melancholy sight of the box-kites that Darwinians occasionally launch in tribute to their dead; two radar dishes aligned to create a transmission tunnel through which émigrés pass as pulses of light; a gathering of Darwinians attempting to contact the *deus ex machina* intervening on their behalf. Indeed, *Darwinia* is a game that makes you look at polygons with awe and emotion.



By protecting *Darwinia's* digital Sea Monkeys, you allow them to continue evolving until they're finally able to recreate the events of 1969's Woodstock.

The biggest battles will make a beefy system chug, and at around 10 hours from beginning to end, it's a sadly brief ride. But in *Darwinia*, there are no gaming clichés, no retreads, no been-there-shot-that moments. Unexpectedly touching and ruthlessly entertaining, *Darwinia* is one of the most original and inspired PC games we've ever played.

DARWINIA — **9**

$30, www.darwinia.co.uk, ESRB: NR

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—LOGAN DECKER

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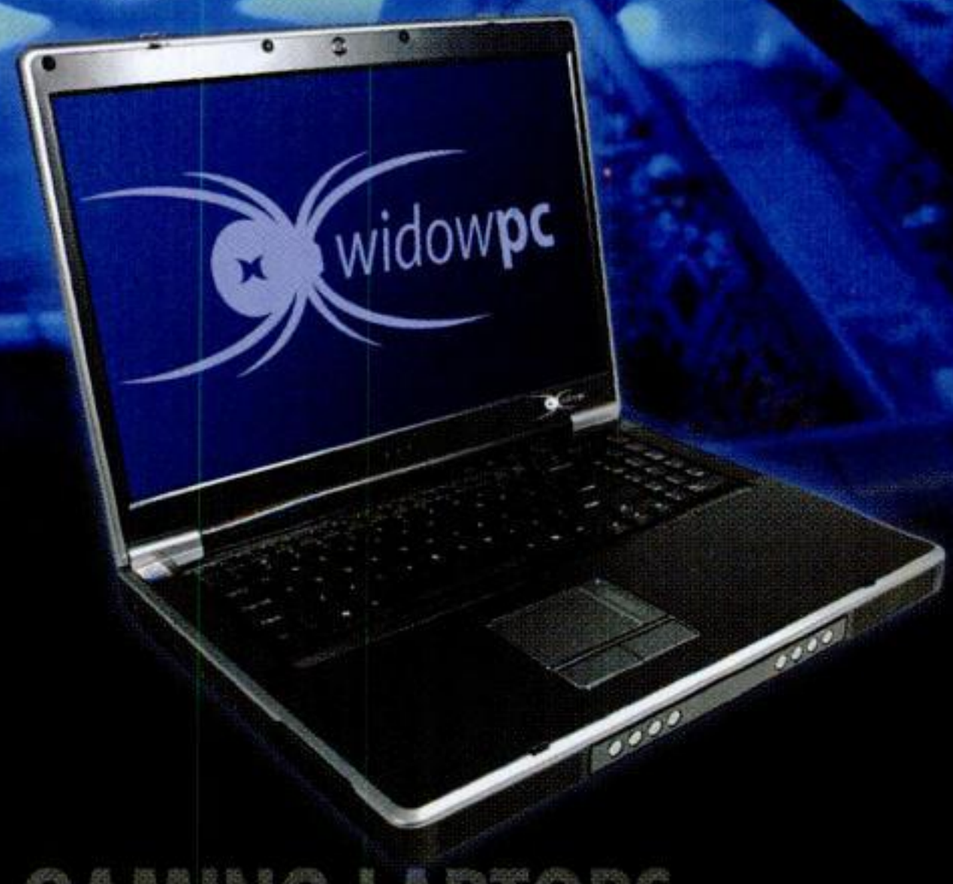

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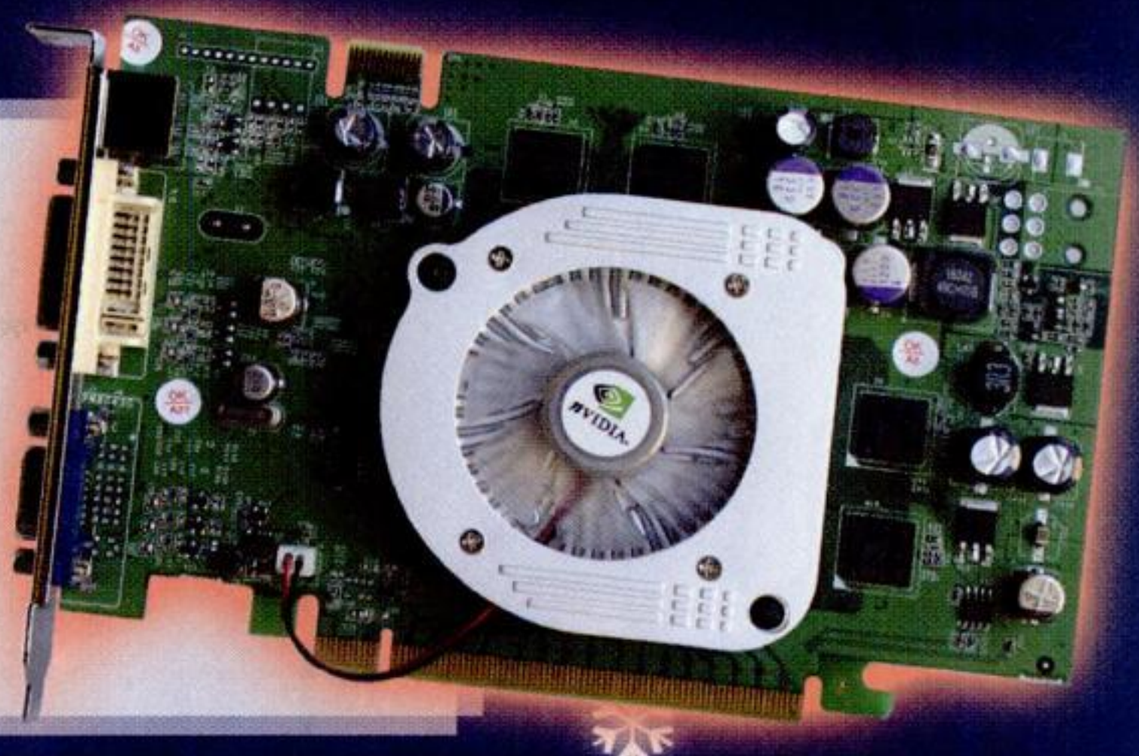

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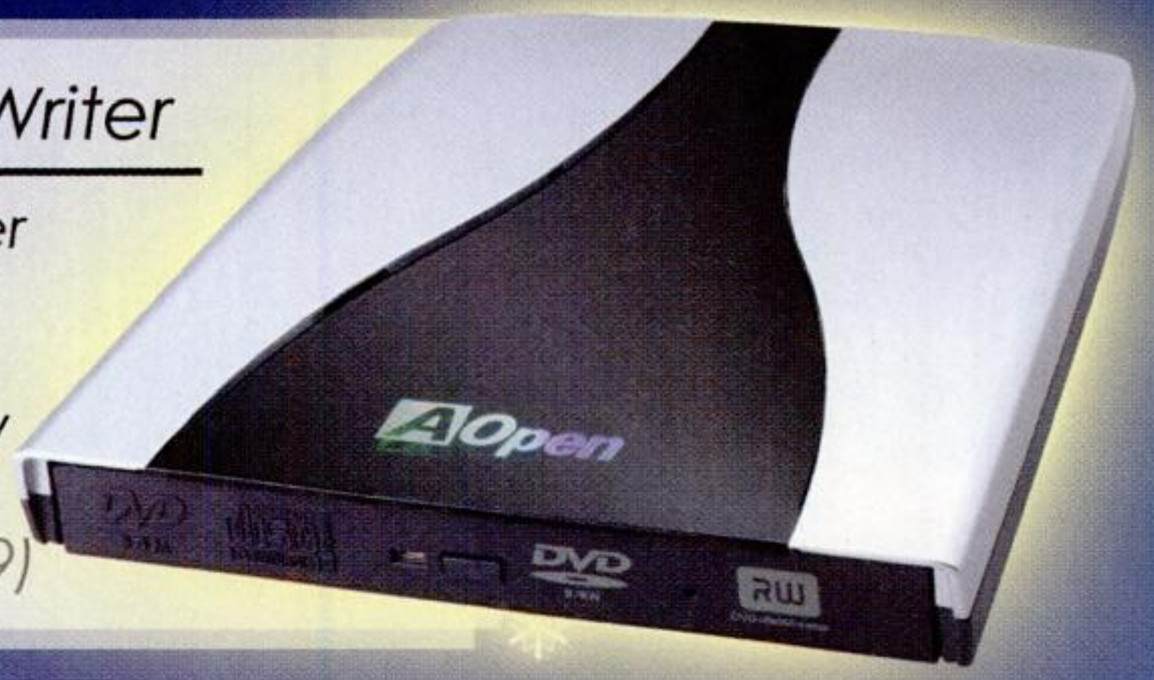

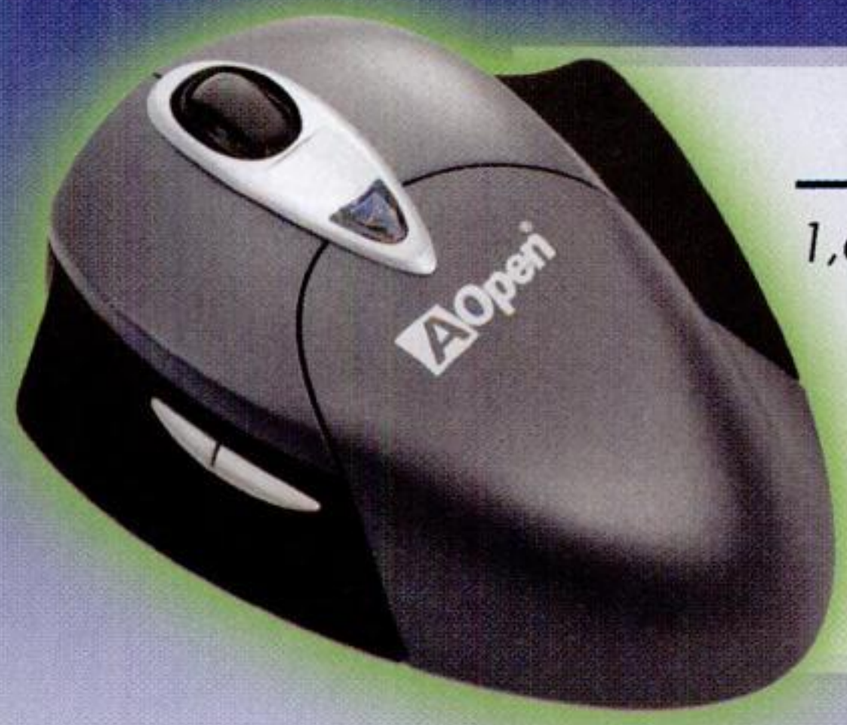

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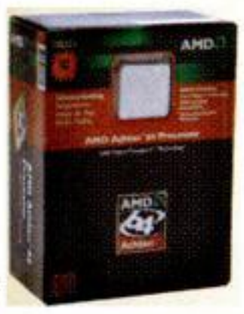

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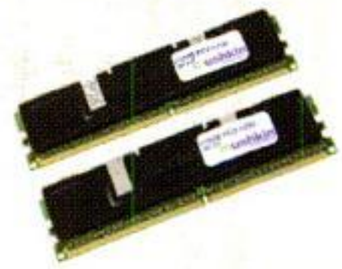

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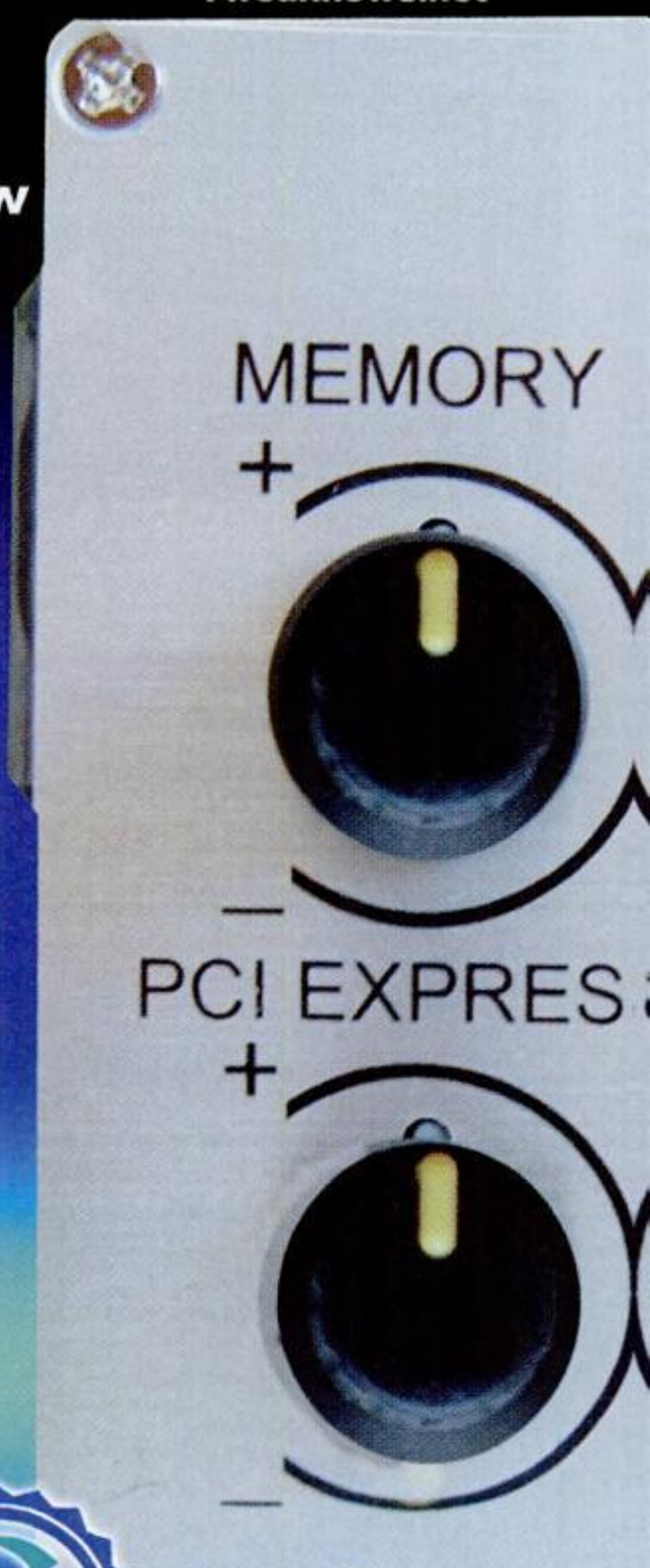

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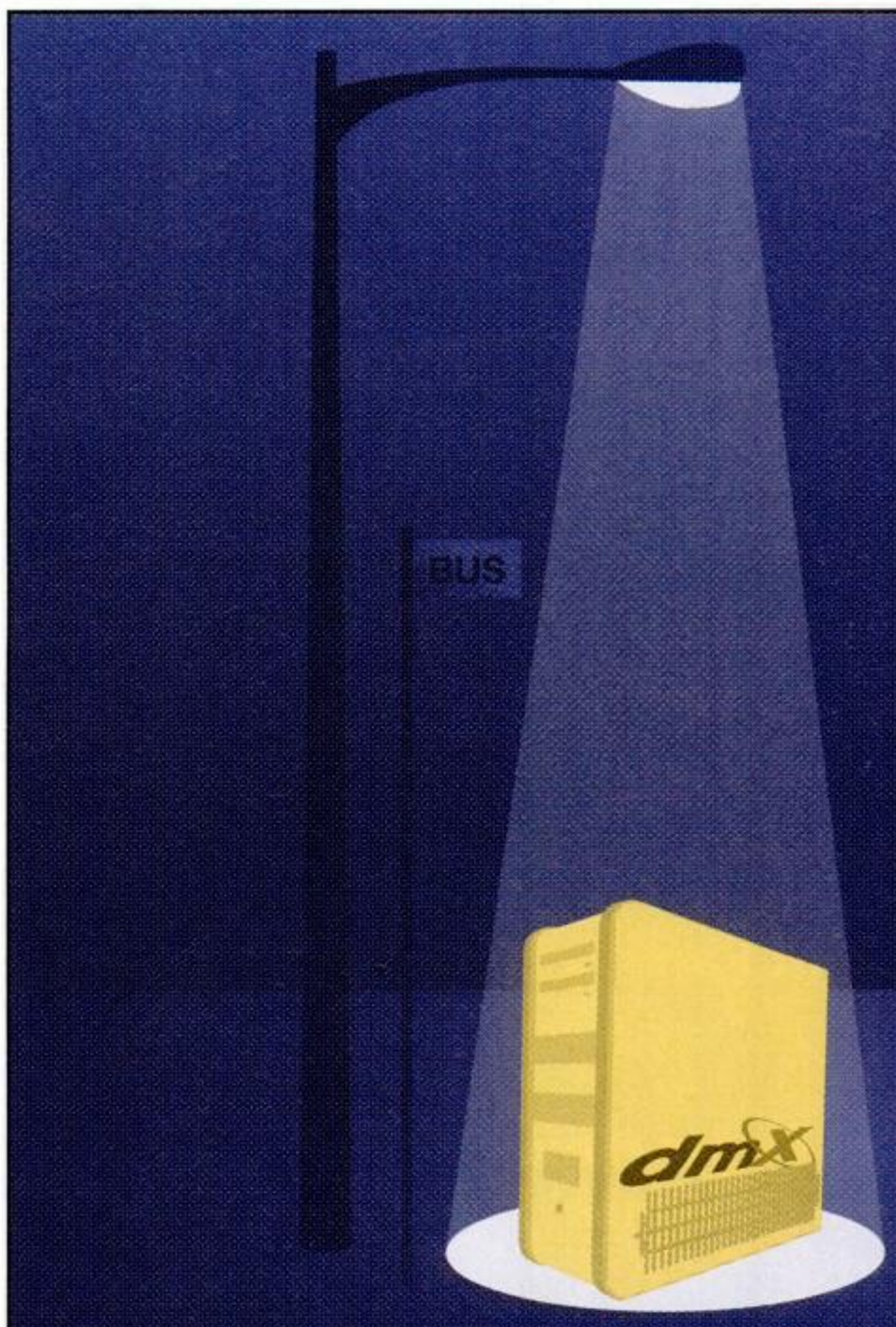

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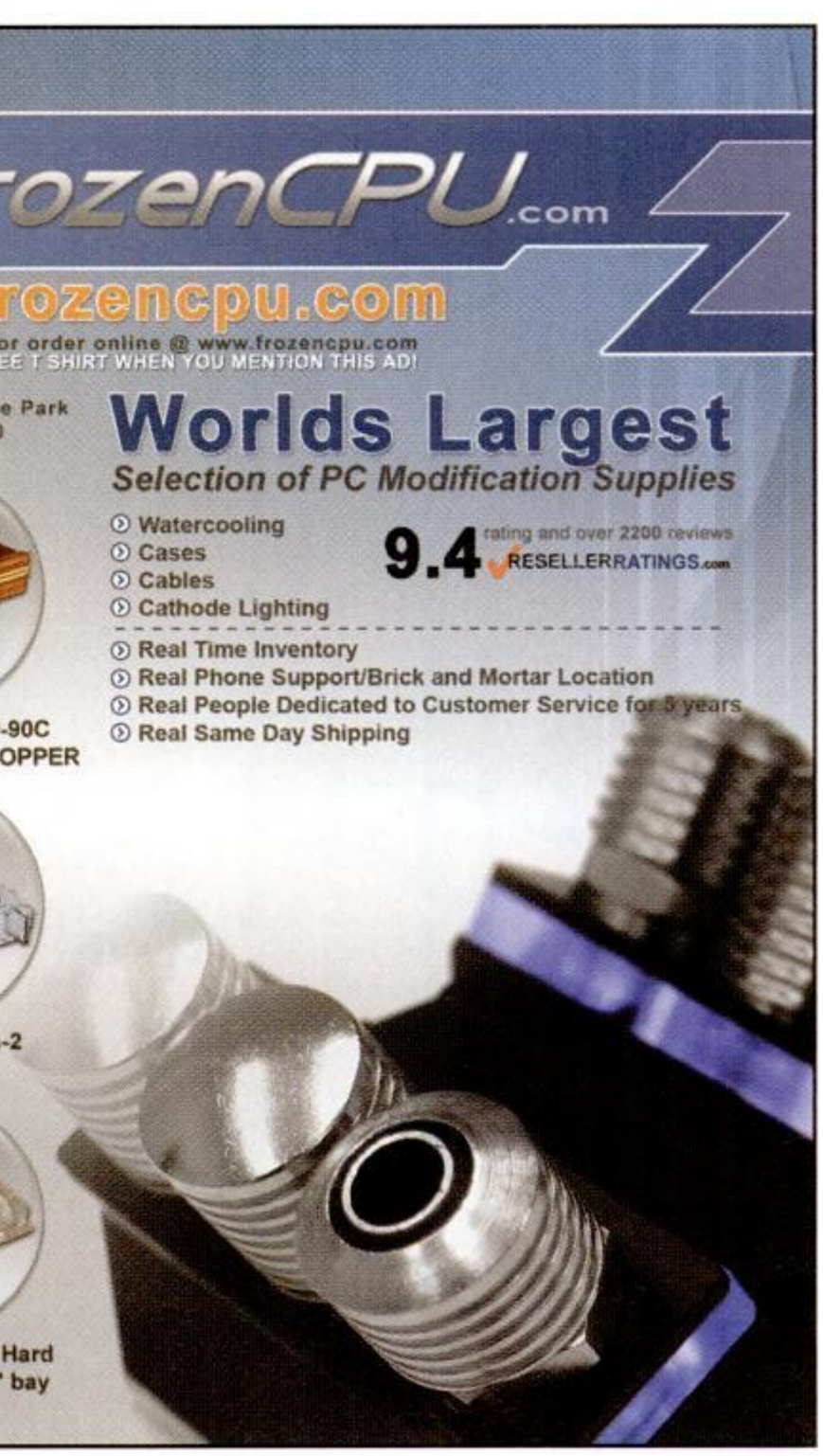

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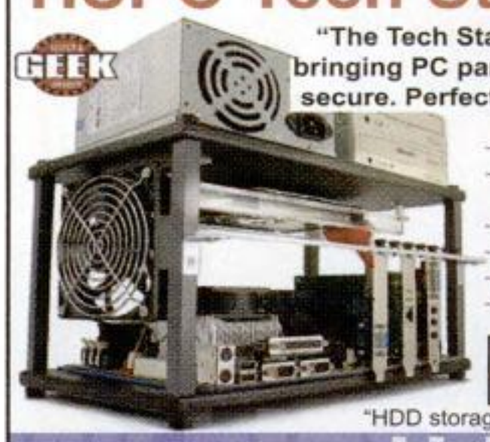

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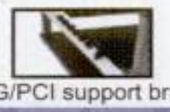

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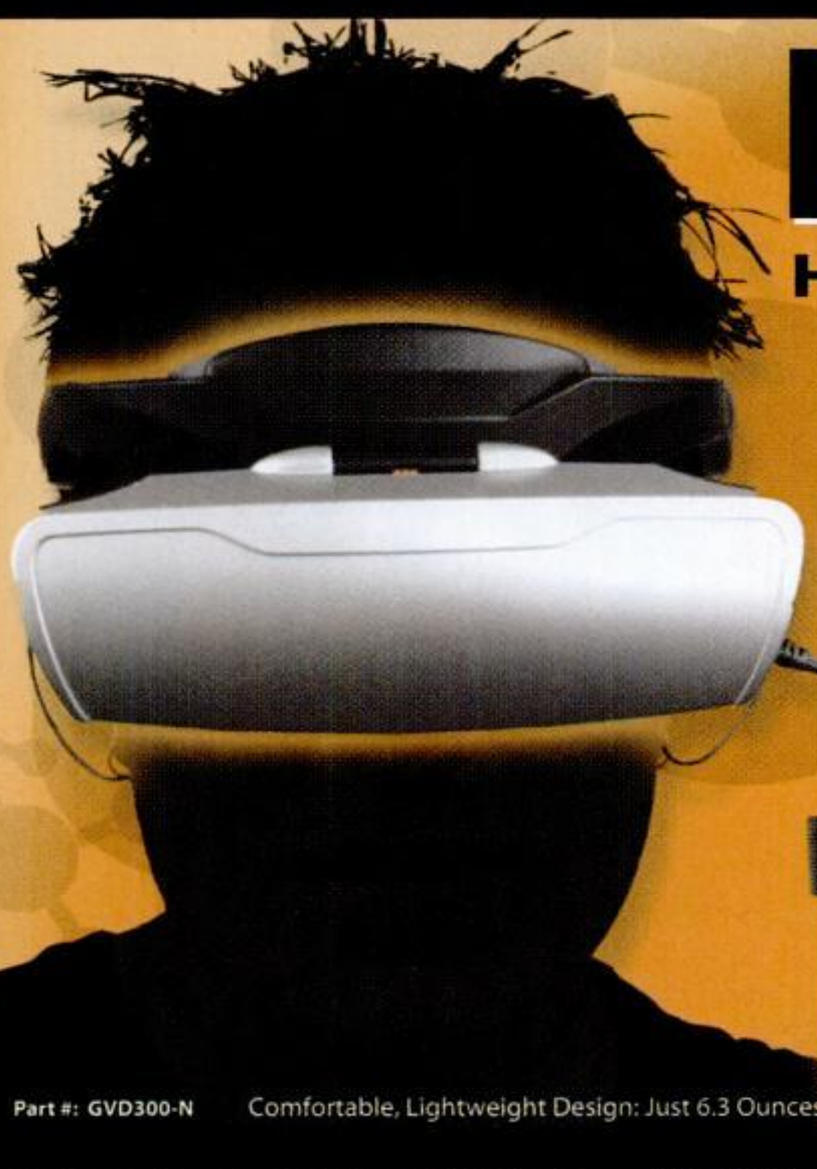

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THE WAITING REALLY IS THE HARDEST PART

After six months of waiting for just the right price/performance point to upgrade my graying Athlon XP system, I read in your October issue that nVidia is updating its nForce4-based chipsets to include support for dual x16 PCI-E graphics slots. Cool, I can wait another month or so for that. Maybe by then, that Athlon 64 X2 chip I've been looking at will be a few bucks cheaper.

But you also write about rumors of AMD moving to a brand-new socket (Socket M2) in mid-2006. So, is my Socket 939 Dream Machine going to be obsolete at that point? Am I forced to wait for (another) new mobo/CPU spec? If I build now, will I be reduced to shopping on e-Bay for a CPU upgrade in a year?

Please help! I'm already developing a nervous twitch from waiting this long to build my Dream Machine.

—Scott Holcomb

EDITOR IN CHIEF WILL SMITH RESPONDS: You've fallen into one of the classic traps of upgrading, Scott. The longer you wait, the older the hardware you're buying becomes. But are you really going to upgrade soon enough that you need to worry about future-proofing your mobo?

I'm sure you bought your Athlon XP system expecting to update the processor to something else that would slide into its Socket A. If you're going to measure the time between upgrades in years instead of months, you should consider your mobo and CPU a matched pair. Odds are, to get the latest and greatest at the end of 2007, you'll need to upgrade both if you want to upgrade your CPU.

Instead of worrying about your hardware becoming obsolete, make sure you spend your money in the right places when you make your upgrade. Get a proc that's fast enough to last you more than a year. Remember that the best deals are usually found one bump from the fastest proc, and don't skimp on the side orders—get plenty of RAM, a fast videocard, and a speedy hard drive.

SEE YA, CRT

In the October "Best of the Best" section (In The Lab) it states that the CRT spot will be discontinued due to waning interest. Please don't do this.

Tell me I'm not the only person out there who prefers a variable-resolution CRT to an LCD with its fixed native resolution. Sure LCDs use less power, desktop space, and generate less heat, but as I understand things, if I have an LCD display running at a native 1600x1200 but play a particular game at 1024x768 I am going to have to choose between a smaller "letter-boxed" style display or play with my game interpolated. As a result, I need a CRT monitor to allow me to enjoy a game regardless of the resolution I play at. Am I mistaken?

—Warren Anderson

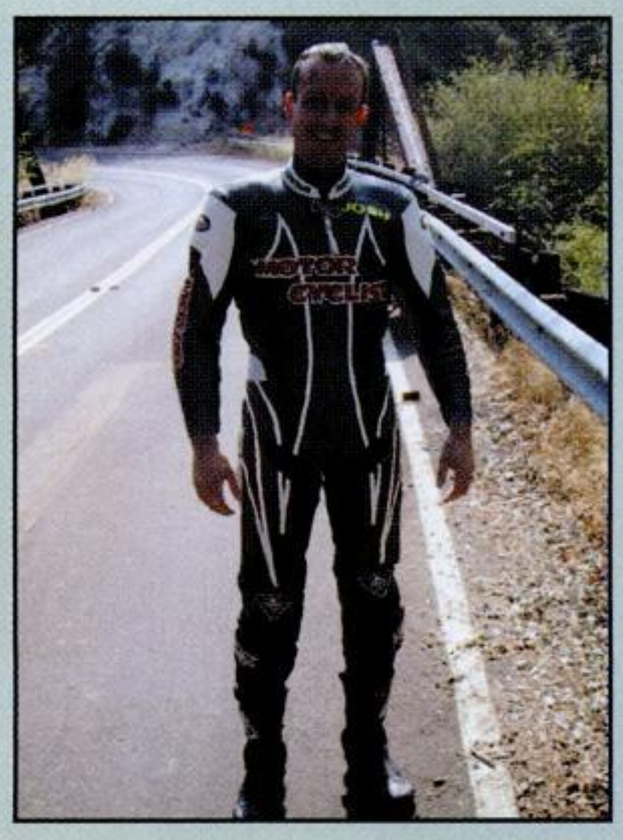
MANAGING EDITOR KATHERINE STEVENSON RESPONDS: You're correct about the resolution limitations of an LCD, but you're indeed in the minority by sticking with a CRT. Even the most hardcore gamers on this staff have found the benefits of an LCD (which you point out) worth the compromise. What's more, manufacturers by and large have ceased putting resources into consumer CRT development (meaning, they won't be releasing new CRTs, just continuing to make the old models), so we don't see a need to focus on the category. That said, if a company releases a new CRT worth reviewing, we will definitely do that.

PERENNIAL PROPS TO PLEXTOR?

I found your review of Plextor's PX-716SA unconvincing. Did you even consider BenQ's DW1640 drive, which every online reviewer has rated better than the Plextor? Don't get me wrong—I do use Plextor drives; in fact, the Plexwriter Premium is the secondary optical drive in my PC. But the Plextor PX-716SA is grossly overpriced, has a lot of compatibility issues, doesn't perform that good, and hasn't received a

But We're Not Maximum Motorcycle

I have been an avid reader of your magazine for more than six years and look forward to each and every issue. After reading the article on Steve Wright's Rig of the Month, the "ZX-6R PC," in the September 2005 issue, I realized just how lucky I am that your magazine is all about computers and not motorcycles. You guys obviously have no idea what you are talking about when it comes to sport bikes. Your article states that "...the ZX-6R's seat frame provides ample room for a PC." The article should say that the ZX-6R's spar frame provides ample room for a PC. The PC is located in the section of the frame that houses the engine. The seat frame is actually located further aft and wouldn't even provide ample room for a Mac Mini. Keep up the great work and please, stay away from motorcycles in future issues.



—Jeff

EDITOR IN CHIEF WILL SMITH RESPONDS: I blame Josh.

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top rating from the online community. It seems like you're almost favoring the Plextor brand.

—R. L. Das

FEATURES EDITOR LOGAN DECKER RESPONDS: "Almost" favoring the Plextor brand? We've favored it as long as the drives have delivered Kick Ass performance. Show us a cheaper DVD burner that charts two-digit access times and can burn to 2.4x DVD+R double-layer media at 6x speed, and we'll rip the tiara off the Plexy's head and pass it along. We're not sure what you mean by "doesn't perform that good"—perhaps you're referring to the shockingly slow DVD-ripping speed, which can be throttled up using the bundled *PlexTools* software (covered in In The Lab, November 2005). But let's be clear on this: Although there are plenty of good hardware review sites on the net, we rely exclusively on our own benchmarks and observations when we evaluate the hardware we receive from manufacturers.

Good point about BenQ's DW1640, though. The company surprised us by vaulting into the upper ranks of the optical drive Hall of Fame with its fast, LightScribe-enabled DW1625 (which was also bundled with software tools rivaling Plextor's *PlexTools*). With performance like that, you can bet we'll be inviting BenQ back into the Lab soon.

WHINING WIDESCREEN

I'm surprised you missed the fatal flaw in the Dell 2405FPW LCD, or you were lucky enough to receive a monitor without it.

After five minutes of use, the monitor emits a high-pitched whine that makes you want to blow your brains out. I have returned two and have now given up on them. This issue is serious enough to knock down the rating of the otherwise superb monitor.

—Joe DeCeglie

MANAGING EDITOR KATHERINE STEVENSON RESPONDS: Your complaint was of serious concern to us, as we've been recommending the 2405FPW ever since we reviewed the LCD in September and gave it a 9 verdict and our Kick Ass award. While we have never personally experienced the problem you describe—even after running our review model in a closed room all day—we're aware of the thread on Dell's forum dedicated to the matter. We checked with a representative of Dell and have been assured that there's a fix for the models that emit the so-called "high-pitched whine;" you need to contact Dell's technical support for details: http://support.dell.com or 800-624-9896.

NETCELL IS NOT FOR SALE

You used a Netcell Revolution SATA PCI-X RAID card as part of your dual-everything Dream Machine. This card is impossible to find at any retailer online. Have you any idea why?

—Roman Iwanczuk

ASSOCIATE EDITOR JOSH NOREM RESPONDS: We spoke with our contact at Netcell, and he told us the company had planned to have a distribution partner for the 64-bit PCI-X cards by now, but it just hasn't happened. The company has inked a deal with XFX Technologies (www.xfxforce.com) to sell the 32-bit standard PCI version, but says Netcell will be selling the PCI-X versions directly from its website (www.netcell.com). Our contact said that if for some reason you can't find the card on the Netcell site under the "products" section, or if you have any further questions, don't hesitate to contact netcell_sales@netcell.com.

HOW MUCH VIDEOCARD CAN I HANDLE?

I'm a gamer and just upgraded to an Athlon 64 3700+ and a motherboard that supports both AGP and PCI Express. I normally play games on a 19-inch CRT monitor at 1024x768 resolution. How powerful does my videocard need to be in order to play games at that resolution with all the "eye candy" enabled?

—Jamey Evitts

EXECUTIVE EDITOR MICHAEL BROWN RESPONDS: You don't say what your budget is, so I'll give you some broad guidelines based on our most recent benchmarking experiences. First, because your motherboard supports PCI Express, you should absolutely buy a PCI Express videocard—there's no reason to sink money into hardware based on dead specs.

If you want all the eye candy enabled at 1024x768, you should choose a card with 256MB of memory, a 256-bit memory interface, and at least a 16-pipe GPU. Cards based on either nVidia's GeForce 6800 GT or ATI's X800 XL will fit the bill, and you should find plenty of such cards priced well under $300. If that's too rich for your budget, and you can tolerate either slower frame rates or lower resolution, go for a 12-pipe card based on nVidia's GeForce 6800. You'll find these cards in the $200 range. ATI's new 12-pipe X800 GTO might also be worthy of consideration, but we haven't tested one yet. MPC

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It's lonely at the top, but that's offset by the fact that you're a winner and everyone else is a *loser*. That's Gear of the Year for you! *Maximum PC* names the best hard drive, the slickest DVD burner, the coolest water-cooler—more than 15 categories of power-user hardware you shouldn't be without.

DIGITAL MEDIA PLAYER BUYERS GUIDE

There's a swarm of new portable audio and video players arriving just in time for the new year—which ones will win praise from the golden ears and eyes at *Maximum PC*? Check out the monster media player with the 7-inch widescreen, and see if Apple's iPod Nano is all that and a bag of chips. Plus, tons o' accessories!

MAKING THE SWITCH

After a few stiff shots of bourbon, Editor in Chief Will Smith held his nose and dove headfirst into the Bizzaro world of the Macintosh. What's it like living on the other side? Find out next month!

DONALD ROCK'S

Cinematron

At *Maximum PC* we're all about the cutting edge—the latest and greatest hardware, the never-ending upgrade path. But on the flipside of all that progress is a whole lot of undesirable, has-been hardware, and it's cool when someone comes up with an inventive way to make use of that stuff. (It *all* can't go into the creation of Grandma's email machine.)

Donald Rock's Cinematron combines old PC parts and discarded steel conduit to form a piece of interactive modern art. Indeed, the fully-functioning computer, which runs Vector Linux 5.1 and is primarily used to play movies, has all the power it needs to inspire awe. Its artfully balanced, high-tech aesthetic is just plain cool. And you won't find a common mouse and keyboard disrupting its character: All functions are performed via Telnet, with commands sent from a laptop to a transceiver built into the sculpture.

All of the machine's parts, save the optical drive, reside in this 14.5x7x15-inch chamber. The hard drive, visible through an acrylic window in the front, is a 14-platter, 23GB Seagate SCSI drive that Rock got for $5 from a surplus website.

Look familiar? This box was once a PSU; now it's home to the Cinematron's power and reset buttons. What goes around comes around, or something like that.

There is nothing wrong with your television. Do not attempt to adjust the picture.... The Cinematron is capable of rendering its picture (often a scene from the old sci-fi classic *Outer Limits*) as ASCII art, with help from the Linux-based *MPlayer*.

LEDs housed in the gutted case of an old CD-ROM drive signify the hard drive's various states.

If you have a contender for Rig of the Month, e-mail **rig@maximumpc.com** with high-res digital pics and a 300-word write-up.

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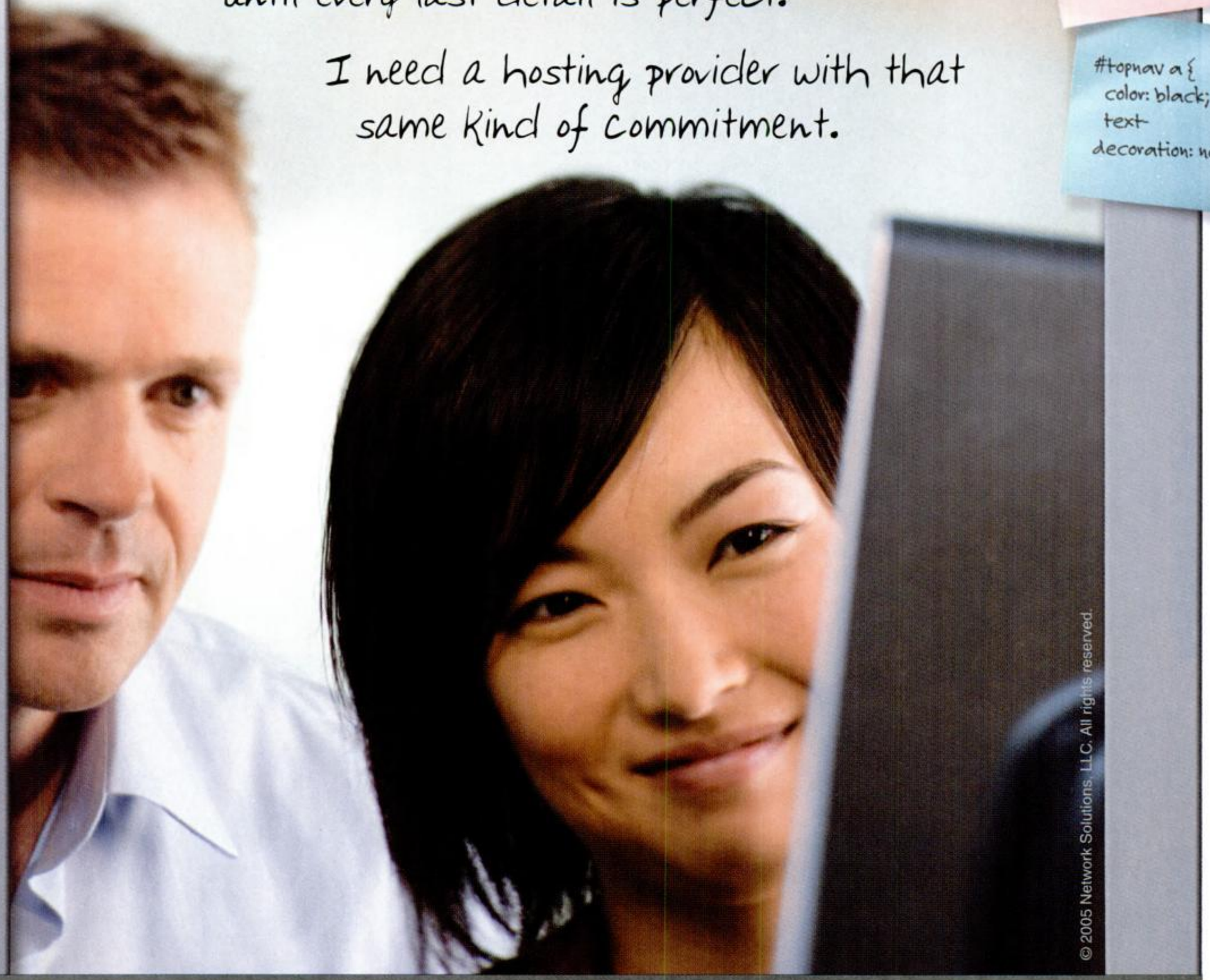

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